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ANNUAL REPORT OF THE
GOVERNOR OF THE
PANAMA CANAL, 1935

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ANNUAL REPORT
OF THE
GOVERNOR OF
THE PANAMA CANAL

FOR THE
FISCAL YEAR
ENDED JUNE 30

1935



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1935

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REPORTS OF HEADS OF DEPARTMENTS AND DIVISIONS

APPENDIXES NOT PRINTED

The material in the annual report of the Governor of the Panama Canal, published in this volume, is to a large extent a summary of the data presented in the annual reports from the heads of departments and divisions in the Canal organization; the latter, regarded as appendixes to the report of the Governor, are not printed. The annual reports of the Panama Railroad Co. and the health department are published separately; the latter is compiled for calendar years only. The reports of the heads of departments and divisions, as listed below, may be seen at the Washington Office of the Panama Canal or at the office of the Governor at Balboa Heights, Canal Zone:

Engineer of maintenance, report of—

Dredging division, report of superintendent.

Plans section, report of chief.

Assistant engineer of maintenance, report of—

Madden Dam division, report of construction engineer.

Electrical division, report of electrical engineer.

Municipal engineering division, report of municipal engineer.

Division of lock operation, report of superintendent.

Office engineer, report of.

Section of surveys, report of chief.

Marine division, report of marine superintendent.

Mechanical division, report of superintendent.

Supply department, report of chief quartermaster.

Accounting department, report of comptroller.

Executive department:

Division of civil affairs, report of chief.

Police and fire division, report of chief.

Division of schools, report of superintendent.

Bureau of clubs and playgrounds, report of general secretary.

Surveying officer, report of.

Magistrates' courts:

Magistrate, Cristobal, report of.

Magistrate, Balboa, report of.

Land agent, the Panama Canal and Panama Railroad Co., report of.

Purchasing department, report of general purchasing officer and chief of

Washington office.

Pardon board, report of chairman.

Senior aeronautical inspector, report of.

ANNUAL REPORT
OF THE
GOVERNOR OF THE PANAMA CANAL

BALBOA HEIGHTS, CANAL ZONE,
September 27, 1935.

The SECRETARY OF WAR,
Washington, D. C.

SIR: I have the honor to submit the report of the Governor of the Panama Canal for the fiscal year ended June 30, 1935.

Particular attention is invited to the statements in sections I and III of the report wherein is set forth in some detail the need for legislation for removing the existing inequalities in the treatment of shipping now passing through the Panama Canal and to prevent further reduction in tolls charges by means of making structural alterations in vessels that reduce net tonnages but have practically no effect on their cargo-carrying capacity. Ships now pay widely divergent amounts per ton of actual earning capacity because under the dual measurement system now in use the tolls are limited by a measurement of net tonnage which is not related closely to their earning capacity. The divergence between actual earning capacity and the limiting factor which governs the maximum collection of tolls grows greater year by year, and correspondingly the revenues of the Government are being unwarrantably and unnecessarily depleted through our inability, under the present law, to collect tolls on an equitable and uniform basis.

There is also a need, which grows more pressing year by year, for legislation which will enable the Canal Administration to make small cash payments ranging from \$10 to \$25 per month to superannuated native workers who have faithfully served the Canal over a considerable number of years. Each year increasing numbers of these workers are becoming unfit for further active service and while efforts are made to transfer them to light duties or to provide institutional care at the Corozal Farm, it would be more economical to grant them a small monthly annuity and permit them to live in their native environment and to be cared for by members of their own race. The necessity for this legislation is discussed at greater length in section III of the report.

The need for the legislation outlined above is urgent, and its enactment is earnestly recommended.

Details of the more important features pertaining to Canal operation and maintenance are given in the accompanying report.

Respectfully,

J. L. SCHLEY, *Governor.*

SUMMARY

Administration of the Panama Canal involves three main elements—(a) The operation and maintenance of the Canal proper, which primarily involves the maintenance of the waterway, the operation of the locks, and the control of traffic; (b) the operation of auxiliary business enterprises necessary for shipping and the Canal force, such as coal and fuel oil plants, storehouses for foodstuffs, ships' chandlery, and other essential supplies, marine and railway repair shops, terminal facilities for the transshipment of cargo and passengers, operation of the Panama Railroad on the Isthmus and the Panama Railroad Steamship Line between New York and the Isthmus, quarters for the working force, and other adjuncts essential to the economical and efficient operation of the Canal; and (c) the administration of the government of the Canal Zone, populated by 8,439 American civilians, 21,197 native or tropical workers and their families, and by the United States Army and Navy defense forces, in which administration are embraced education, sanitation, hospital service, police and fire protection, customs, quarantine, immigration services, post offices, etc.

The immediate administration of these various activities rests with the heads of nine major departments and divisions reporting to the Governor, in whom is centered responsibility and control for the entire organization.

OPERATION AND MAINTENANCE OF THE CANAL

The primary function of the Panama Canal is to provide and maintain a waterway by means of which vessels may make the transit from one ocean to the other, and to handle such traffic as presents itself for transit with a maximum of safety and a minimum of delay. Throughout the year the Canal force maintained its high standard of expeditious service not only in the actual transiting of ships but in providing emergency repairs, fuel, supplies, and the various supplementary services incidental to shipping.

There were no interruptions to traffic during the year.

BUSINESS OPERATIONS

Secondary only to the operation of the Canal is the function of supplying various services to shipping. Commerce requires at the Canal certain adjuncts essential to shipping, such as fuel-oil plants, coaling stations, drydocks, marine repair shops, terminal facilities for the transshipment of cargo and passengers, storehouses for the purchase of ships' chandlery, commissaries for the replenishment of food supplies, and similar essential services. These services, under coordinated and centralized control, are provided by the various business units of the Panama Canal and Panama Railroad Co. The coordination of such services with the transit of ships through the Canal assists materially in the efficient and economical operation of the waterway. Moreover, in providing marine repair facilities, fuel, and other supplies at reasonable cost, the operation of these business units promotes traffic through the Canal.

ADMINISTRATION—GOVERNMENT

The usual functions of government, such as schools, police and fire protection, quarantine, public health, immigration service, posts, customs, aids to navigation, steamboat inspection, hydrographic and meteorological work, water supply, sewers, construction and maintenance of streets, and similar activities which, in the United States, are directed by various officers of the national, State, and municipal governments, are entrusted in the Canal Zone to the Governor, and are executed under his authority and responsibility. This centralization of all governmental activities under one head is essential to economical and efficient administration.

SERVICES RENDERED BY THE CANAL TO SHIPPING

The most important items of the business of the Canal and its adjuncts covering principal services to shipping are expressed numerically in the following table, which presents a comparison of the activities during the fiscal year 1935 with the 2 years immediately preceding:

	Fiscal year 1933	Fiscal year 1934	Fiscal year 1935
Transits of Canal by ocean-going ships paying tolls.....	4, 162	5, 234	5, 180
Free transits of ocean vessels.....	445	503	552
Total transits of ocean vessels.....	4, 607	5, 737	5, 732
Transits of local commercial traffic, not counted in ocean-going traffic.....	437	474	634
Number of lockages during year:			
Gatun Locks.....	4, 380	5, 365	5, 316
Pedro Miguel Locks.....	4, 557	5, 507	5, 490
Miraflores Locks.....	4, 505	5, 433	5, 481
Tolls levied on ocean vessels.....	\$19, 601, 077. 17	\$24, 047, 183. 44	\$23, 307, 062. 93
Tolls on local commercial vessels (not included in above).....	\$20, 133. 59	\$18, 519. 58	\$32, 175. 12
Total tolls.....	\$19, 621, 210. 76	\$24, 065, 703. 02	\$23, 339, 238. 05

	Fiscal year 1933	Fiscal year 1934	Fiscal year 1935
Cargo passing through Canal (tons).....	18, 161, 165	24, 704, 009	25, 309, 527
Net tonnage (Panama Canal measurement) of transiting vessels.....	22, 803, 798	28, 550, 953	27, 805, 588
Cargo per Panama Canal net ton of ocean vessels, includ- ing those in ballast.....	. 7964	. 8653	. 9102
Average tolls per ton of cargo, including tolls on vessels in ballast.....	\$1. 0793	\$0. 9734	\$0. 9209
Average tolls per Panama Canal net ton of vessel meas- urement, including vessels in ballast.....	\$0. 8596	\$0. 8423	\$0. 8382
Calls at Canal ports by ships not transiting Canal.....	854	989	925
Cargo handled and transferred at ports (tons).....	1, 026, 128	1, 157, 649	1, 289, 898
Coal, sales and issues (tons).....	39, 327	52, 657	43, 696
Coal, number of commercial ships bunkered.....	197	196	198
Fuel oil pumped (barrels).....	6, 022, 663	9, 710, 247	9, 713, 542
Fuel oil—number of ships served other than vessels operated by the Panama Canal.....	1, 188	1, 724	1, 703
Ships repaired, other than Panama Canal equipment.....	501	513	522
Ships drydocked, other than Panama Canal equipment.....	89	49	97
Provisions sold to commercial ships (commissary sales).....	\$294, 416. 69	\$330, 570. 82	\$348, 697. 46
Chandlery sold to ships (storehouse sales).....	\$26, 386. 27	\$28, 165. 99	\$48, 730. 33

NOTE.—The statistics for commercial traffic for 1933 and 1934 in the above table (including transits, tonnage, tolls, etc.) differ somewhat from those appearing in last year's report due to the elimination from the ocean-going traffic, and adding to the local commercial traffic, of all ships under 300 tons.

REVENUES AND EXPENSES

The net revenues from Canal operations proper were \$14,519,506.01, as compared with \$16,810,348.06 last year. Net revenues from business operations under the Panama Canal for 1935 were \$1,021,-216.61, as compared with \$1,366,755.12 in 1934. The combined net revenues accruing from the Canal and its business units totaled \$15,540,722.62 as compared with \$18,177,103.18 in 1934. The capital investment at the beginning of the fiscal year was \$543,744,707.09, and the net revenue represented a return of 2.86 percent on the investment, as compared with 3.37 percent the preceding year.

The foregoing figures do not include the operations carried on with funds of the Panama Railroad Co.; these resulted in a net profit of \$899,195.79, as compared with \$1,156,738.14 for the preceding year, a decrease of \$257,542.35.

EARNINGS AND REPLACEMENTS

With respect to the operations of the Panama Canal, it will be noted that the net revenues from both Canal and business operations were somewhat lower than in the previous year. During the fiscal year 1935 the restoration of the reductions in salary and wage scales enforced under the economy acts adversely affected the net revenues of both Canal and business operations; the former were further adversely affected by the expenses incidental to the quadrennial overhaul of the Atlantic Locks, and by increased dredging activities in connection with channel-maintenance work which could not longer be deferred. As was pointed out in my report last year, an abnormal condition existed in 1934 in that, notwithstanding a substantial increase in tolls for that year in comparison with 1933, there was an actual decrease in operating costs which, under normal conditions,

should have increased. Except for 1934, the net earnings have fallen short each year since 1930 of returning 3 percent on the capital investment, which is regarded as the minimum of fair return.

The past fiscal year marked the close of 21 years of successful operation of the Panama Canal; in fact, its dependable and efficient service in shortening the routes of the world's commerce is now taken for granted.

One of the elements which has made this possible is the high state of maintenance in which all wearing and deteriorating parts are kept. It is estimated that of the total capital value of the Panama Canal there are approximately \$150,000,000 of general structural values subject to deterioration and requiring regular repair and periodical replacement, but without reserve funds from operating revenues by which to defray the costs thereof. These have been in service for 21 years.

Some of these structures, such as dams, breakwaters, and concrete buildings, are still in excellent condition and require but little expenditure for upkeep; but on others deterioration has reached a point where replacement should not longer be deferred. These necessary replacements include not only the frame buildings originally erected to serve during the period of the construction of the Canal but also docks, highways, etc., which, due to ordinary deterioration and to earth slides and other unforeseen conditions, have been rendered inadequate or unserviceable for present requirements or uneconomical to maintain.

There seems to be a general misunderstanding that because the earnings of some of the activities of the Canal are authorized for reexpenditures by the Governor, all necessary replacements can be financed from this source. This is far from true as such earnings are comparatively small in amount and may be reexpended only upon the plant facilities from which the earnings were derived. The general structures I refer to are those which are not directly self-supporting, but which, nonetheless, are essential to the primary function of the Canal in the earning of tolls, which revenue must be covered directly into the Treasury. Thus replacement funds are not available for this most essential property, save by direct appropriation by the Congress.

Not only is there demand for extending and enlarging some of the structures but also the need develops for new kinds of facilities. Funds for such structures must also be obtained by direct appropriation.

For these reasons, it is essential to the continued efficiency of the Canal and to the growth of its facilities to meet the growing demands that the Bureau of the Budget and the Congress give careful consideration to the requirements submitted annually by the Governor for these purposes.

SECTION I

CANAL OPERATION AND TRADE VIA PANAMA CANAL

TRAFFIC IN 1935

Transits of ocean-going commercial vessels¹ in 1935 numbered 5,180 as compared with 5,234 transits in the previous year, a decline of 54, or 1.1 percent. For the year, transits through the Canal averaged 14.19 per day as compared with 14.34 in 1934, 11.40 in 1933, 11.92 in 1932, 14.71 in 1931, 16.51 in 1930, and 17.23 in 1929, when traffic through the Canal attained its peak. In comparison with the previous year, there also was a decline of 2.6 percent in Panama Canal net tonnage and 3.1 percent in tolls. On the other hand, the volume of cargo carried through the Canal was higher, showing an increase of 2.5 percent as compared with the preceding year.

The method of classifying ships passing through the Canal was changed during the year, and all previous traffic summaries have been revised to show statistics on the basis of the revised classification. Traffic is now segregated into three classes, namely, (1) ocean-going commercial traffic, which includes all tolls-paying vessels of 300 or more net tons, Panama Canal measurement, or 500 or more tons, displacement measurement; (2) local commercial traffic, which includes all tolls-paying vessels of less than 300 net tons, Panama Canal measurement, and also all tolls-paying naval vessels under 500 tons displacement measurement; and (3) vessels transiting the Canal free of tolls. The last named classification includes all naval and other vessels owned and operated in the Government service of the United States and Panama, war vessels of Colombia, and vessels transiting the Canal solely for repairs at the Balboa shops.

Previously, the tolls-paying vessels were classified by commercial ships of 20 net tons or over, and launches under 20 net tons. The new classification was devised with a view to giving better comparative statistics covering the transit of normal-sized commercial vessels, primarily with a view to preventing these statistics from being distorted by frequent transits of small toll-paying vessels engaged in local trade between the two coasts of Central America.

The history of Canal traffic has reflected five distinct trends in the world's economic and commercial developments. After the opening of the Canal on August 15, 1914, there was a slow growth through 8 years, in which the maximum of transits was 2,791 in 1921. The rise in Californian oil production was primarily responsible for raising the transits to 3,908 in 1923 and 5,158 in 1924. Traffic continued at

¹ Includes all toll-paying vessels having a measurement of 300 or more net tons or 500 or more displacement tons.

about this level until the business expansion brought a considerably increased volume toward the end of the last decade when Canal traffic reached peaks of 6,289 in transits, \$27,111,125.47 in tolls, 30,647,768 in cargo tonnage, and 29,963,670 in net tonnage, Panama Canal measurement. From these peaks the world-wide depression resulted in a sharp curtailment of traffic, the low point being reached in 1933 when transits dropped to 4,162, tolls to \$19,601,077.17, cargo tonnage to 18,161,165, and net tonnage, Panama Canal measurement, to 22,803,798. Beginning in August 1932, a gradual increase in Canal traffic began, coincident with the general improvement in economic conditions, and total traffic for the fiscal year 1933 nearly equaled that of the previous year.

During the fiscal year 1934 the improvement continued uninterrupted until March when four successive declines occurred at the close of the fiscal year. In June 1934 the decline was particularly marked, due principally to strikes on the west coast of the United States which tied up shipping. Beginning in July 1934, and continuing until November, each month's traffic through the Canal again showed an increase over the preceding month. Thereafter, traffic declined steadily until the end of the fiscal year. A marked decrease in shipments of mineral oils from California was partly responsible for this decline. In June 1935 traffic through the Canal reached its lowest point since August 1934; the decrease being attributed in part to seasonal factors and in part to labor troubles on the west coast of the United States.

In the fiscal year 1935 the transits of naval and other public vessels of the United States Government, public vessels of the Colombian Government, and vessels transiting solely for repairs, none of which pay tolls, numbered 552, as compared with 503 for 1934. The total of tolls-paying and free transits combined, which includes all ocean-going vessels of 300 tons or more, numbered 5,732, in comparison with 5,737 in 1934, making daily averages of 15.70 and 15.72, respectively.

Net tonnage of the ocean-going commercial vessels passing through the Canal in 1935 aggregated 27,805,588 tons, Panama Canal measurement, a decrease of 2.6 percent in comparison with 1934. Tolls in 1935 amounted to \$23,307,062.93, decreasing 3.1 percent in comparison with the \$24,047,183.44 collected in the preceding year.

Cargo carried through the Canal in 1935 amounted to 25,309,527 tons and was 2.5 percent higher than cargo in 1934. This increase was due wholly to gains in the tonnage moving from the Atlantic to the Pacific, cargo tonnage in that direction registering an increase of 22.2 percent in comparison with the preceding year. From the Pacific to the Atlantic there occurred a loss in cargo tonnage, the movement in this direction decreasing 4.1 percent. This phase of the traffic is presented in detail under "trade routes and cargo."

The receipts from tolls reported by the accounting department for the fiscal year 1935 were \$23,338,977.90. This figure includes tolls on "local commercial traffic", which are not included in the Canal statistics covering "ocean-going commercial traffic." The accounting department figures on tolls also have been adjusted in accordance with refunds for overcharges and supplemental collections in the event of undercharges. These items account for the difference of \$31,914.97 between the accounting figures and the figure for tolls levied on ocean-going commercial traffic as reported in the following studies of traffic, which are based on tolls levied at the time of transit.

Comparative traffic statistics covering ocean-going vessels for each fiscal year since the Canal was opened to navigation are shown in the table below:

Fiscal year ended June 30—	Number of transits	Panama Canal net tonnage	Tolls	Tons of cargo
1915 ¹	1,058	3,791,770	\$4,366,747.13	4,888,400
1916 ²	724	2,391,433	2,403,089.40	3,093,335
1917.....	1,738	5,791,236	5,620,799.83	7,054,720
1918.....	1,989	6,563,864	6,428,780.26	7,525,768
1919.....	1,948	6,116,877	6,164,290.79	6,910,097
1920.....	2,393	8,538,804	8,507,938.68	9,372,374
1921.....	2,791	11,405,550	11,268,681.56	11,595,971
1922.....	2,665	11,411,482	11,191,828.56	10,882,607
1923.....	3,908	18,601,298	17,504,027.19	19,566,429
1924.....	5,158	26,142,021	24,284,659.92	26,993,167
1925.....	4,592	22,847,527	21,393,718.01	23,956,549
1926.....	5,087	24,763,075	22,919,931.89	26,030,016
1927.....	5,293	26,210,623	24,212,250.61	27,733,555
1928.....	6,253	29,436,697	26,922,200.75	29,615,651
1929.....	6,289	29,822,122	27,111,125.47	30,647,768
1930.....	6,027	29,963,670	27,059,998.94	30,018,429
1931.....	5,370	27,773,037	24,624,599.76	25,065,283
1932.....	4,362	23,613,370	20,694,704.61	19,798,986
1933.....	4,162	22,803,798	19,601,077.17	18,161,165
1934.....	5,234	28,550,953	24,047,183.44	24,704,009
1935.....	5,180	27,805,588	23,307,062.93	25,309,527
Total.....	82,221	394,344,795	359,634,696.80	388,923,506

¹ Canal opened to traffic Aug. 15, 1914.

² Canal closed to traffic approximately 7 months of fiscal year by slides.

TRAFFIC BY MONTHS

The commercial traffic during each month of the fiscal year is summarized in the following table, in which are inserted for comparison the figures for the preceding year:

Month	Number of vessels		Panama Canal net tonnage		Tons of cargo		Tolls	
	1933-34	1934-35	1933-34	1934-35	1933-34	1934-35	1933-34	1934-35
July.....	382	394	2,049,972	2,177,193	1,697,678	1,934,237	\$1,730,789.73	\$1,822,909.64
August.....	393	401	2,158,755	2,245,247	1,912,679	2,187,780	1,828,329.19	1,966,821.39
September.....	385	435	2,095,215	2,332,351	1,795,540	2,142,832	1,757,083.14	1,947,535.76
October.....	433	467	2,414,410	2,516,087	2,123,972	2,172,752	2,034,963.22	2,098,299.03
November.....	432	469	2,393,779	2,546,417	1,948,655	2,339,001	2,000,060.65	2,137,916.55
December.....	476	443	2,616,777	2,331,250	2,191,245	2,089,310	2,203,319.45	1,952,192.57
January.....	479	425	2,581,095	2,294,137	2,086,480	1,945,085	2,159,642.48	1,911,094.13
February.....	452	430	2,461,993	2,205,057	2,123,956	1,836,383	2,078,950.58	1,826,999.63
March.....	508	455	2,702,006	2,398,231	2,464,735	2,210,434	2,280,217.26	2,018,114.62
April.....	469	432	2,492,529	2,258,926	2,290,795	2,079,028	2,120,640.81	1,890,572.41
May.....	459	424	2,566,067	2,366,455	2,301,666	2,291,968	2,146,421.35	1,996,156.81
June.....	366	405	2,018,355	2,134,237	1,766,608	2,080,717	1,706,774.58	1,798,449.39
Total.....	5,234	5,180	28,550,953	27,805,588	24,704,009	25,309,527	24,047,183.44	23,307,062.93
Average per month.....	436	432	2,379,246	2,317,132	2,058,667	2,109,127	2,003,931.95	1,942,255.24

TANKER TRAFFIC

Transits of tank ships during the fiscal year 1935 totaled 791, a decrease of 151, or 16 percent in comparison with the 1934 total of 942. Tanker transits in 1935 comprised 15.3 percent of the total commercial transits, made up 16.8 percent of the total net tonnage (Panama Canal measurement), paid 18 percent of the total tolls collected, and carried 19.4 percent of the cargo which passed through the Canal.

Cargo carried through the Canal in tank ships during the fiscal year 1935 amounted to 4,914,902 tons, in comparison with 5,909,531 tons in 1934, a decrease of 994,629 tons, or 16.8 percent. Segregation of the 1935 traffic by direction of transit shows that 440,194 tons of tanker cargo went through from the Atlantic to the Pacific, and 4,474,708 tons from the Pacific to the Atlantic.

Of the mineral oil cargoes carried through the Canal during the fiscal year 1935, approximately 30 percent was gasoline, benzine, and naphtha; 30 percent crude oil; 27 percent gas and fuel oils; and the remainder, 13 percent, lubricating oils and kerosene.

The three tables below, which begin with the fiscal year 1923 and thus cover the period during which tankers have been an important component of the traffic through the Canal, show the composition of the traffic as divided between tank ships and all other commercial or toll-paying vessels, classified herein as "general." The tables show the number and daily averages of the two classes, and of the total; the quantities and proportion of net tonnages; and the amounts and proportions of tolls:

Number and daily average transits of tankers and general carriers

Fiscal year	Ocean-going commercial transits			Daily average		
	Tankers	General	Total	Tankers	General	Total
1923.....	913	2,995	3,908	2.5	8.2	10.7
1924.....	1,704	3,454	5,158	4.7	9.4	14.1
1925.....	1,079	3,513	4,592	3.0	9.6	12.6
1926.....	1,090	3,997	5,087	3.0	11.0	14.0
1927.....	1,324	3,969	5,293	3.6	10.9	14.5
1928.....	1,121	5,132	6,253	3.0	14.0	17.0
1929.....	1,083	5,206	6,289	3.0	14.2	17.2
1930.....	1,218	4,809	6,027	3.3	13.2	16.5
1931.....	944	4,426	5,370	2.6	12.1	14.7
1932.....	612	3,750	4,362	1.7	10.2	11.9
1933.....	636	3,526	4,162	1.7	9.7	11.4
1934.....	942	4,292	5,234	2.6	11.7	14.3
1935:						
July.....	89	305	394	2.9	9.8	12.7
August.....	80	321	401	2.6	10.3	12.9
September.....	63	372	435	2.1	12.4	14.5
October.....	76	291	467	2.5	12.6	15.1
November.....	75	394	469	2.5	13.1	15.6
December.....	64	379	443	2.1	12.2	14.3
January.....	58	367	425	1.9	11.8	13.7
February.....	54	276	430	2.0	13.4	15.4
March.....	50	405	455	1.6	13.1	14.7
April.....	50	382	432	1.7	12.7	14.4
May.....	61	363	424	2.0	11.7	13.7
June.....	71	334	405	2.3	11.2	13.5
Total.....	791	4,389	5,180	2.2	12.0	14.2

Proportions of tanker and general net tonnage

	Panama Canal net tonnage			Percentage of total net tonnage		
	Tankers	General	Total	Tankers	General	Total
1923-----	5,374,384	13,226,914	18,601,298	28.9	71.1	100.0
1924-----	10,212,047	15,929,974	26,142,021	39.1	60.9	100.0
1925-----	6,424,622	16,422,905	22,847,527	28.1	71.9	100.0
1926-----	6,343,240	18,419,835	24,763,075	25.6	74.4	100.0
1927-----	7,624,112	18,586,511	26,210,623	29.1	70.9	100.0
1928-----	6,243,969	23,192,728	29,436,697	21.2	78.8	100.0
1929-----	5,844,263	23,977,859	29,822,122	19.6	80.4	100.0
1930-----	6,564,138	23,399,532	29,963,670	21.9	78.1	100.0
1931-----	5,284,873	22,488,164	27,773,037	19.0	81.0	100.0
1932-----	3,570,398	20,042,972	23,613,370	15.1	84.9	100.0
1933-----	3,808,784	18,995,014	22,803,798	16.7	83.3	100.0
1934-----	5,811,995	22,738,958	28,550,953	20.4	79.6	100.0
1935-----	4,676,761	23,128,827	27,805,588	16.8	83.2	100.0

Proportion of tolls from tank ships and from all other vessels

	Tolls paid by shipping using Canal			Percentage of total tolls		
	Tankers	General	Total	Tankers	General	Total
1923-----	\$4,769,324.63	\$12,734,702.56	\$17,504,027.19	27.2	72.8	100.0
1924-----	9,071,835.65	15,212,824.27	24,284,659.92	37.4	62.6	100.0
1925-----	5,728,302.26	15,665,415.75	21,393,718.01	26.8	73.2	100.0
1926-----	5,626,167.93	17,293,763.96	22,919,931.89	24.5	75.5	100.0
1927-----	6,658,806.90	17,553,443.71	24,212,250.61	27.5	72.5	100.0
1928-----	5,436,437.16	21,485,763.59	26,922,200.75	20.2	79.8	100.0
1929-----	5,145,632.19	21,965,493.28	27,111,125.47	19.0	81.0	100.0
1930-----	5,768,963.28	21,291,035.66	27,059,998.94	21.3	78.7	100.0
1931-----	4,682,320.14	19,942,279.62	24,624,599.76	19.0	81.0	100.0
1932-----	3,197,136.29	17,497,568.32	20,694,704.61	15.4	84.6	100.0
1933-----	3,393,311.02	16,207,766.15	19,601,077.17	17.3	82.7	100.0
1934-----	5,161,787.40	18,885,396.04	24,047,183.44	21.5	78.5	100.0
1935-----	4,192,863.09	19,114,199.84	23,307,062.93	18.0	82.0	100.0

NATIONALITY OF VESSELS

Segregation of the ocean-going commercial traffic through the Canal during the fiscal year 1935, by nationality, is presented in the following table which shows transits, measurement tonnage, tolls, and tons of cargo:

Ocean-going traffic through the Panama Canal during fiscal year 1935 by nationality of vessels

Nationality	Number of transits	Measurement tonnage				Tolls	Tons of cargo
		Panama Canal net	United States equivalent	Registered			
				Gross	Net		
British-----	1, 170	6, 635, 211	4, 718, 307	7, 919, 176	4, 784, 724	\$5, 671, 310. 93	5, 776, 021
Chilean-----	13	43, 965	34, 009	59, 255	35, 200	42, 262. 12	39, 063
Colombian-----	1	540	516	700	500	388. 80	-----
Danish-----	125	593, 497	384, 162	646, 163	397, 078	467, 522. 46	555, 981
Danzig-----	49	388, 177	329, 948	594, 629	333, 531	351, 700. 14	440, 186
Finnish-----	3	14, 553	11, 312	18, 883	10, 091	12, 629. 78	17, 325
French-----	116	661, 712	438, 760	799, 403	448, 216	535, 219. 62	570, 034
German-----	341	1, 316, 785	908, 301	1, 539, 606	921, 385	1, 116, 058. 87	1, 300, 991
Greek-----	15	62, 362	47, 226	74, 969	45, 979	52, 774. 99	78, 158
Italian-----	77	487, 680	332, 747	613, 465	361, 752	397, 293. 79	336, 196

Ocean-going traffic through the Panama Canal during fiscal year 1935 by nationality of vessels—Continued

Nationality	Number of transits	Measurement tonnage				Tolls	Tons of cargo
		Panama Canal net	United States equivalent	Registered			
				Gross	Net		
Japanese.....	255	1,483,609	1,124,926	1,803,738	1,115,718	\$1,374,808.88	1,446,049
Netherland.....	114	548,240	369,988	620,915	373,979	456,111.55	439,168
Norwegian.....	515	2,479,200	1,659,092	2,773,674	1,670,863	1,946,216.95	2,463,675
Panamanian.....	103	204,128	130,866	246,319	130,671	154,038.55	121,758
Peruvian.....	10	6,529	6,022	9,621	5,485	7,368.57	2,283
Polish.....	1	563	535	1,561	525	405.36	-----
Spanish.....	1	-----	-----	-----	-----	1,678.00	-----
Swedish.....	111	546,207	383,524	973,816	470,060	439,371.95	782,548
United States.....	2,143	12,265,794	8,496,072	14,233,046	8,451,318	10,215,751.94	10,825,573
Venezuelan.....	2	2,162	2,116	4,084	2,160	2,090.70	1,929
Yugoslavian.....	15	64,674	50,229	80,333	50,041	62,058.98	112,589
Total fiscal year:							
1935.....	5,180	27,805,588	19,428,658	33,013,356	19,609,276	23,307,062.93	25,309,527
1934.....	5,234	28,550,953	20,333,299	34,347,583	20,523,877	24,047,183.41	24,704,009
1933.....	4,162	22,803,798	16,351,160	27,153,415	16,519,025	19,601,077.17	18,161,165

NOTE.—The above statement includes only ocean-going commercial traffic of 300 net tons or over, Panama Canal measurement, and foreign naval vessels of 500 tons displacement or over.

Segregating the traffic through the Canal by nationality of vessels, the following table shows the aggregate cargo carried by ships of the leading maritime nations during each of the past 5 fiscal years. For the year 1935, the percentage of total cargo carried by ships of each nationality is also shown.

Tons of cargo carried

Nationality	1931	1932	1933	1934	1935	
					Tons	Percentage
United States.....	11,805,132	8,835,055	7,987,739	11,578,453	10,825,573	42.8
British.....	5,971,024	4,637,388	4,170,995	5,193,136	5,776,021	22.8
Norwegian.....	1,720,383	1,427,284	1,773,161	2,080,833	2,463,675	9.7
Japanese.....	1,104,512	1,031,704	1,159,733	1,510,916	1,446,049	5.7
German.....	1,261,763	1,078,738	813,231	962,218	1,300,991	5.1
Swedish.....	721,945	761,015	403,169	766,921	782,548	3.1
French.....	508,011	338,586	249,395	430,471	570,034	2.3
Danish.....	606,100	521,481	448,863	533,262	555,981	2.2
Danzig.....	185,982	238,884	347,934	575,125	440,186	1.7
Netherland.....	477,628	440,870	381,071	403,451	439,168	1.7
Italian.....	236,570	215,139	189,371	256,465	336,196	1.3
All remaining.....	466,233	272,842	236,503	412,758	373,105	1.6
Total.....	25,065,283	19,798,986	18,161,165	24,704,009	25,309,527	100.0

Twenty-one nationalities were represented in the ocean-going commercial traffic passing through the Canal in 1935, compared with 23 in 1934 and 21 in 1933. Vessels of United States registry led in the number of transits, as has been the case during the preceding 16 years. From 1915 to 1918, inclusive, transits of British vessels exceeded those of any other country. In all years of operation, either British or United States vessels have led in transits.

FOREIGN NAVAL VESSELS

In the Canal traffic statistics, foreign naval vessels such as colliers, transports, supply ships, etc., with a measurement of 300 net tons or more, and foreign naval vessels such as battleships, cruisers, destroyers, submarines, etc., with a displacement measurement of 500 tons or more, are classified as "ocean-going commercial" vessels. Statistics on these vessels, except as relates to displacement tonnage, have been included in the traffic summaries shown on the preceding pages. As displacement tonnage cannot be combined with net tonnage, however, the following table shows foreign naval vessels transiting the Canal which paid tolls on the basis of displacement tonnage:

Nationality	Number of transits	Displacement tonnage	Tolls
British.....	11	69,487	\$34,743.50
French.....	4	19,382	9,691.00
German.....	1	7,030	3,515.00
Peruvian.....	4	2,304	1,152.00
Spanish.....	1	3,356	1,678.00
Total.....	21	101,559	50,779.50

VESSELS ENTITLED TO FREE TRANSIT

Naval and other vessels owned and operated in the Government service of the United States and Panama, war vessels of Colombia, and vessels transiting solely for repairs at the Balboa shops, are exempt from the payment of tolls, and such vessels are not included in the general transit statistics in this section.

The following shows the vessels of each group, the amount of tolls to which they would have been subject at the prescribed rates if tolls had been charged against them, and the cargo carried by such vessels in ocean-to-ocean movement:

Class	Number of transits	Panama Canal net tonnage	Displacement	Tolls	Tons of cargo
U. S. Navy.....	344	237,995	1,070,912	\$735,474.38	45,603
U. S. Army.....	176	412,789	21,744	381,221.55	25,957
Other U. S. Government.....	7	-----	3,288	1,644.00	-----
Total U. S. Government.....	527	650,784	1,095,944	1,118,339.93	71,560
Colombian Government.....	5	1,135	5,400	3,692.50	750
Solely for repairs.....	18	22,046	3,578	15,930.00	-----
Byrd Expedition.....	2	5,431	-----	4,747.50	100
Grand total.....	552	679,396	1,104,922	1,142,709.93	72,410

LOCAL TRAFFIC

Transits of small cargo-carrying vessels, and other small craft such as yachts, tugs, etc., of less than 300 tons Panama Canal measure-

ment or less than 500 tons displacement measurement, are excluded from the statistics of commercial traffic, although they are not exempt from the payment of tolls. The number of these small vessels transiting the Canal during the year, the tolls collected thereon, etc., are shown in the following table:

	Number of transits	Panama Canal net tonnage	Displacement tonnage	Tolls	Tons of cargo
Atlantic to Pacific:					
Local commercial.....	361	17, 132	-----	\$16, 172. 36	3, 316
Naval, etc.....	4	-----	620	310. 00	-----
Pacific to Atlantic:					
Local commercial.....	269	14, 009	-----	15, 692. 76	14, 907
Naval, etc.....	-----	-----	-----	-----	-----
Total.....	634	31, 141	620	32, 175. 12	18, 223

TRADE ROUTES AND CARGO

Cargo shipments through the Panama Canal during the fiscal year 1935 and in the 3 preceding years, segregated by principal trade routes, are shown in the following tabulation:

	Tons of cargo			
	1932	1933	1934	1935
United States intercoastal:				
Atlantic to Pacific.....	1, 917, 052	1, 595, 087	2, 074, 707	2, 162, 641
Pacific to Atlantic.....	4, 705, 932	4, 831, 521	6, 850, 261	5, 800, 769
Total.....	6, 622, 984	6, 426, 608	8, 924, 968	7, 963, 410
United States and Far East (including Philippine Islands):				
Atlantic to Pacific.....	1, 714, 725	1, 323, 003	1, 822, 955	2, 532, 280
Pacific to Atlantic.....	851, 124	1, 077, 734	1, 535, 733	1, 067, 426
Total.....	2, 565, 849	2, 400, 737	3, 358, 688	3, 599, 706
Europe and South America:				
Atlantic to Pacific.....	206, 908	164, 695	212, 213	304, 212
Pacific to Atlantic.....	1, 532, 204	1, 368, 234	2, 433, 350	2, 640, 962
Total.....	1, 739, 112	1, 532, 929	2, 645, 563	2, 945, 174
Europe and Canada:				
Atlantic to Pacific.....	69, 926	70, 573	85, 153	77, 282
Pacific to Atlantic.....	2, 109, 790	2, 788, 173	2, 010, 898	2, 335, 108
Total.....	2, 179, 716	2, 858, 746	2, 096, 051	2, 412, 390
Europe and United States:				
Atlantic to Pacific.....	334, 160	249, 966	320, 366	379, 785
Pacific to Atlantic.....	1, 834, 090	1, 700, 808	1, 530, 881	1, 388, 187
Total.....	2, 168, 250	1, 950, 774	1, 851, 247	1, 767, 972
East coast United States and west coast South America:				
Atlantic to Pacific.....	116, 638	44, 474	108, 447	142, 870
Pacific to Atlantic.....	1, 001, 749	294, 076	1, 633, 499	1, 380, 790
Total.....	1, 118, 387	338, 550	1, 741, 946	1, 523, 660
Europe and Australasia:				
Atlantic to Pacific.....	286, 740	235, 075	252, 680	320, 280
Pacific to Atlantic.....	422, 227	295, 896	600, 931	615, 144
Total.....	708, 967	530, 971	853, 611	935, 424

	Tons of cargo			
	1932	1933	1934	1935
United States and Hawaiian Islands:				
Atlantic to Pacific.....	127, 576	63, 798	114, 227	111, 030
Pacific to Atlantic.....	395, 843	349, 938	381, 131	368, 024
Total.....	523, 419	413, 736	495, 358	479, 054
United States and Australasia:				
Atlantic to Pacific.....	187, 393	164, 215	211, 018	277, 477
Pacific to Atlantic.....	81, 501	18, 552	81, 303	152, 567
Total.....	268, 894	182, 767	292, 321	430, 044
Miscellaneous routes and sailings:				
Atlantic to Pacific.....	670, 599	596, 184	960, 883	1, 221, 864
Pacific to Atlantic.....	1, 232, 809	929, 163	1, 483, 373	2, 030, 829
Total.....	1, 903, 408	1, 525, 347	2, 444, 256	3, 252, 693
Total traffic, all routes:				
Atlantic to Pacific.....	5, 631, 717	4, 507, 070	6, 162, 649	7, 529, 721
Pacific to Atlantic.....	14, 167, 269	13, 654, 095	18, 541, 360	17, 779, 806
Total.....	19, 798, 986	18, 161, 165	24, 704, 009	25, 309, 527

ORIGIN AND DESTINATION OF CARGO

The following tables show the origin and destination, by principal trades areas, of the cargoes carried by steamers passing through the Canal during the past fiscal year; one table covers the movement of cargo from the Atlantic to the Pacific, and the other from the Pacific to the Atlantic.

From—	To west coast, North America					To west coast, South America						
	United States	Canada	Central America and Mexico	Balboa ¹	Hawaiian Islands	Total	Chile	Colombia	Ecuador	Peru	South America ²	Total
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
East coast North America:												
United States:												
North Atlantic ports	1,589,621	6,719	6,530	9,778	99,416	1,712,064	64,617	14,978	8,876	40,048	11,693	140,212
South Atlantic ports	54,057			45	1,450	55,552						
Gulf ports	518,963	21,466		4,600	10,164	555,193	1,618		241	799		2,658
Total, United States	2,162,641	28,185	6,530	14,423	111,030	2,322,809	66,235	14,978	9,117	40,847	11,693	142,870
Canada	23,717	45,885				69,302	2,386	2,005	145	1,413	4,295	10,244
Central America and Mexico			20,417			20,417	30,267					30,267
Cristobal, Canal Zone	11,491	45	46,800			58,336	26,553	24,941	19,678	23,898	3,583	98,653
West Indies	6,525	21,335	8,429	46,050	2	82,341	23,857	20	22,819	659	504	47,859
Total, North America	2,204,374	95,150	82,176	60,473	111,032	2,553,205	149,298	41,944	51,759	66,817	20,075	329,893
Europe:												
British Isles	51,186	52,426	5,257	535		109,404	53,751	2,409	3,057	27,258	10	86,485
Belgium	78,182	5,255	17,287	124		101,420	28,985	2,496	2,854	14,459	2,757	51,551
Denmark	1,225		4,195			5,420	12,140	1,825	2,630	35		16,630
France	14,012	878	723	11	43	15,667	2,073		60	1,192	394	3,723
Germany	78,539	4,444	29,644	1,187	795	114,609	21,245	3,894	8,014	21,860	5,853	60,866
Italy	8,937	5,340	3,386		16	17,679	1,397			1,546	59	3,004
Netherlands	9,062	4,837				13,899	9,884	829	880	4,849	772	17,214
Norway	21,373	313	5,037	9,961	1,066	37,690	4,527	3,061	4,752	1,956	1,230	15,556
Russia	45,153					45,153						
Spain and Portugal	2,466	2,280	118			4,864	1,389			457	14	1,860
Sweden	56,664	524	1,654	364		59,206	10,083	221	353	2,196	51	12,904
Europe ¹	12,986	985	956			14,927	7,329	1,115	867	3,728	21,380	34,419
Total, Europe	379,785	77,282	68,257	12,182	2,432	539,938	152,803	15,856	23,467	79,566	32,520	304,212
East coast, South America:												
Asia	110,495	4,266	2,176	2,337	10	119,284	92,111	11,155	167	1,326	42	104,801
Africa (other than Egypt)	816			16		832						
Egypt	58					58						
Total	783			5		788						
Grand total	2,696,311	176,698	152,609	75,013	113,474	3,214,105	394,212	68,955	75,393	147,709	52,637	738,906
Percentage of total cargo: 1935	35.8	2.3	2.0	1.0	1.6	42.7	5.2	0.9	1.0	2.0	0.7	9.8
1934	41.4	3.1	2.3	.6	2.1	49.5	3.9	1.2	.8	1.8	.5	8.2

1 Includes both local and transit cargo.

2 General cargo not routed so as to allow segregation between definite countries.

¹ Includes both local and transit cargo.² General cargo not routed so as to allow segregation between definite countries.

Origin and destination of cargo through the Panama Canal during 1935 from Atlantic to Pacific, segregated by countries in principal trade areas—Continued

From—	To Australasia				To Asia				Grand total	Percentage of total cargo	
	Australia	New Zealand	Australasia ²	Total	Philippine Islands	China	Japan	Far East ²		Total	1935
East coast North America:											
United States:											
North Atlantic ports.....	Tons 157, 125	44, 353	Tons 68	201, 546	Tons 120, 054	Tons 170, 027	Tons 1, 001, 313	Tons 37, 692	Tons 1, 329, 086	44. 9	43. 8
South Atlantic ports.....	6, 413	---	9	6, 422	7, 519	7, 494	110, 165	7, 605	132, 783	2. 6	2. 5
Gulf ports.....	40, 825	21, 493	7, 191	69, 509	6, 040	66, 249	979, 949	18, 173	1, 070, 411	22. 5	24. 6
Total, United States.....	204, 363	65, 846	7, 268	277, 477	133, 613	243, 770	2, 091, 427	63, 470	2, 532, 280	70. 0	70. 9
Canada.....	72, 875	41, 033	4, 023	117, 931	744	5, 232	44, 962	243	151, 181	3. 3	3. 2
Central America and Mexico.....	65, 865	13, 180	---	79, 045	---	---	11, 094	5, 511	16, 605	1. 9	1. 8
Cristobal, Canal Zone ¹	350	50	164	564	---	---	1, 430	2	1, 432	2. 1	2. 1
West Indies.....	16, 629	---	---	16, 629	15	37, 744	25, 130	---	62, 889	2. 9	3. 8
Total, North America.....	343, 453	136, 738	11, 455	491, 646	134, 372	286, 746	2, 174, 043	69, 226	2, 664, 387	80. 2	80. 8
Europe:											
British Isles.....	16, 145	275, 720	15, 813	307, 678	---	---	---	---	---	6. 7	6. 8
Belgium.....	---	877	1, 500	2, 377	---	9, 290	28, 287	---	37, 577	2. 6	2. 8
Denmark.....	5	---	---	5	---	---	---	---	---	. 3	. 4
France.....	10	6, 398	6, 388	6, 398	---	---	---	---	---	. 3	. 4
Germany.....	202	15	217	217	---	3, 444	14, 278	17, 081	34, 803	2. 7	2. 1
Italy.....	12	---	12	12	---	---	---	---	---	. 3	. 4
Netherlands.....	37	61	24	61	---	---	3, 713	---	3, 713	34, 887	5. 5
Norway.....	98	---	98	98	---	---	---	---	---	. 3	. 4
Russia.....	---	---	---	---	---	---	---	---	---	45, 153	. 6
Spain and Portugal.....	6	1	6	6	---	---	---	---	---	6, 730	. 3
Sweden.....	1	---	---	1	---	2, 842	---	---	2, 842	74, 953	1. 0
Europe ²	2, 075	---	1, 352	3, 427	---	---	---	---	---	. 1	. 9
Total, Europe.....	16, 145	279, 043	25, 092	320, 280	---	15, 576	46, 278	17, 081	78, 935	16. 5	16. 0
East coast South America.....	10	---	---	10	---	---	19, 577	1, 500	21, 077	3. 3	3. 2
Asia.....	---	---	---	---	---	---	---	---	---	832	---
Africa (other than Egypt).....	---	---	375	375	---	---	---	---	---	433	---
Egypt.....	---	---	---	---	---	---	---	---	---	788	---
Grand total.....	359, 008	415, 781	36, 922	812, 311	134, 372	302, 322	2, 239, 898	87, 807	2, 764, 399	100. 0	100. 0
Percentage of total cargo, 1935.....	4. 8	5. 5	0. 5	10. 8	1. 8	4. 0	29. 7	1. 2	36. 7	38. 7	38. 7
Percentage of total cargo, 1934.....	3. 5	5. 2	. 6	9. 3	2. 4	6. 3	23. 5	. 8	33. 0	100. 0	100. 0

¹ Includes both local and transit cargo.

² General cargo not routed so as to allow segregation between definite countries.

Origin and destination of cargo through the Panama Canal during 1935 from Pacific to Atlantic, segregated by countries in principal trade areas

From—	To United States				To other North America				To Europe			
	North Atlantic ports	South Atlantic ports	Gulf ports	Total	Canada	Central America and Mexico	Cristobal, Canal Zone ¹	West Indies	Total North America	British Isles	Belgium	Denmark
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
West coast North America:												
United States.....	5,087,591	257,036	456,142	5,800,769	3,619	2,673	73,477	169,429	6,049,967	705,342	49,697	10,787
Canada.....	7,637	—	37,500	45,227	43,859	1,343	2,254	34,645	127,328	1,867,305	64,799	24,790
Central America and Mexico.....	31,000	—	1,717	32,717	—	—	33,448	4,990	71,155	737	893	695
Balboa, Canal Zone ¹	—	—	6,601	6,601	—	—	—	—	6,601	—	—	—
Hawaiian Islands.....	312,435	61	55,528	368,024	—	—	10	2	308,036	24,819	—	—
Total, North America.....	5,438,663	257,097	557,578	6,253,338	47,478	4,016	109,189	209,066	6,623,087	2,598,263	115,389	36,272
West coast, South America:												
Chile.....	1,033,234	166,688	74,355	1,274,277	—	22	6,249	29,240	1,309,788	211,429	67,888	8,845
Colombia.....	16,777	—	49	16,826	—	—	47,196	2	64,024	89	213	—
Ecuador.....	27,388	—	—	27,388	3,500	30	35,873	68	66,859	39,103	10,185	—
Peru.....	50,194	—	—	50,194	429,992	6	6,907	87,633	574,732	732,775	99,004	21,514
South America ²	12,105	—	—	12,105	—	—	9,914	—	13,019	9,032	1,242	2,632
Total, South America.....	1,139,698	166,688	74,404	1,380,790	433,492	58	97,139	116,943	2,028,422	792,428	178,532	32,991
Australasia:												
Australia.....	67,599	—	—	67,599	61,988	—	224	1,016	130,827	5,550	—	—
New Zealand.....	29,822	—	—	29,822	5,016	—	490	437	35,765	460,737	—	—
Australasia ²	55,146	—	—	55,146	—	—	2,173	42	57,361	43,646	550	—
Total, Australasia.....	152,567	—	—	152,567	67,004	—	2,887	1,495	223,953	509,933	550	—
Asia:												
Philippine Islands.....	419,285	10,020	130,673	559,978	30	—	631	427	561,066	392	—	—
China.....	121,945	1,682	6,287	129,914	—	—	8,141	6,174	144,229	24,400	—	—
Japan.....	298,575	23,782	10,096	302,453	—	68	29,111	9,231	340,863	—	—	—
Far East ²	63,178	—	11,903	75,081	—	—	2,256	22,876	100,213	26,543	—	24,120
Total, Asia.....	872,983	35,484	158,959	1,067,426	30	68	40,139	38,708	1,146,371	51,335	—	24,120
Grand total.....	7,603,911	459,269	790,941	8,854,121	548,004	4,142	249,354	366,212	10,021,833	3,951,959	294,471	93,383
Percentage of total cargo: 1935.....	42.8	2.6	4.4	49.8	3.1	—	1.4	2.1	56.4	22.2	1.7	0.5
1934.....	49.7	2.9	4.3	56.9	2.7	—	1.2	1.4	62.2	19.0	1.4	.4

¹ Includes both local and transit cargo.² General cargo not routed so as to allow segregation between definite countries.

Origin and destination of cargo through the Panama Canal during 1935 from Pacific to Atlantic, segregated by countries in principal trade areas—Continued

From—	To Europe							To—				Grand total	Percentage of total cargo		
	France	Germany	Italy	Netherlands	Norway	Spain and Portugal	Sweden	Europe ²	Total	South America	Egypt		Asia	Africa ³	1935
West coast, North America:															
United States	Tons 153,798	Tons 72,883	Tons 24,362	Tons 90,399	Tons 15,563	Tons 4,658	Tons 22,790	Tons 237,908	Tons 1,388,187	Tons 53,685	Tons 103,930	Tons 43	Tons 39,289	42.4	46.9
Canada	70,653	22,753	6,836	34,423	18,483	493	958	223,525	2,335,108	14,513			13,254	14.0	11.9
Central America and Mexico	6,245	12,696	1,045	2,488	4	26,253	4,224	6,187	61,467					.7	.7
Bahama, Canal Zone ¹														6.601	
Hawaiian Islands							179	26	25,024					2.3	2.1
Total, North America	230,696	108,362	32,243	127,310	34,050	31,404	28,151	467,646	3,809,786	68,198		43	52,543	59.4	61.6
West coast, South America:															
Chile	15,830	90,656	23,450	17,280	4,151	1,677	49,819	671,209	1,162,234	205	103,930			14.5	13.6
Colombia	42	2,461		73				201	3,079	679				.4	.4
Ecuador	78,577	703	361	252	100	112		1,327	130,720	189				1.1	1.1
Peru	447,757	24,505	746	13,260	10,203	7	13,126	163,876	1,326,773	1,046				10.7	9.6
South America ²	244	985		407				3,614	18,156					.2	.2
Total, South America	542,450	119,310	24,557	31,272	14,454	1,796	62,945	840,227	2,640,962	2,119	103,930			26.9	24.9
Australasia:															
Australia									5,550					.8	.4
New Zealand	48			482				729	461,996					2.8	2.7
Australasia ²	35,778			10,800		2,000	18,946	35,878	147,598	17				1.1	.8
Total, Australasia	35,826			11,282		2,000	18,946	36,607	615,144	17				4.7	3.9
Asia:															
Philippine Islands									392					3.2	6.4
China		15,606		16,570				224,385	280,961	5				425.195	2.4
Japan								5,982	3,869	3,869				350.714	2.0
Far East ²		8,400		7,587				107,820	173,970	52				274.235	1.4
Total, Asia		24,006		24,157				337,687	461,305	3,926				1,611.602	9.0
Grand total	808,972	251,678	56,800	194,021	48,504	35,200	110,042	1,632,167	7,527,197	74,260	103,930	43	52,543	100.0	100.0
Percentage of total cargo, 1935	4.5	1.4	0.3	1.1	0.3	0.2	0.6	9.5	42.3	0.4	0.6		0.3	100.0	
Percentage of total cargo, 1934	3.8	1.8	.3	1.1	.3	.3	.4	8.2	37.0	.4	.2		.2	100.0	

¹ Includes both local and transit cargo.² General cargo not routed so as to allow segregation between definite countries.³ Other than Egypt.

PRINCIPAL COMMODITIES

Statistics of commodities passing through the Canal are not precise because at the time of transit it is not required that complete manifests of cargo carried by vessels be submitted to the Canal authorities. In lieu of a manifest the master of each vessel is required to submit a "cargo declaration", which is a briefly itemized statement, listing the principal items of cargo carried and showing their ports or country of origin and destination. These cargo declarations form the basis of the commodity statistics. There is a natural tendency not to list small miscellaneous shipments but to include them under the head of "General cargo"; not infrequently no other classification is made of the entire cargoes carried by vessels. Hence, except in the case of commodities commonly shipped in bulk, such as mineral oils carried in tank ships, wheat, lumber, nitrates, etc., shipments of various goods are likely to be in excess of the aggregate tonnage reported during the year and shown in the annual summary. Subject to errors arising from this source, the tonnage of the principal commodities shipped through the Canal during the past 4 years is shown in the following table:

Commodity movement

Commodity	Fiscal year ended June 30—			
	1932	1933	1934	1935
ATLANTIC TO PACIFIC	<i>Long tons</i>	<i>Long tons</i>	<i>Long tons</i>	<i>Long tons</i>
Scrap metal.....	87, 657	273, 375	503, 277	1, 186, 061
Manufactures of iron and steel.....	781, 494	502, 503	982, 596	1, 114, 189
Mineral oils.....	518, 498	407, 492	550, 469	605, 595
Cotton, raw.....	747, 496	432, 043	492, 459	362, 548
Paper and paper products.....	204, 297	214, 568	256, 449	347, 424
Phosphates.....	239, 266	154, 145	188, 320	255, 033
Sulphur.....	197, 941	149, 790	206, 509	208, 678
Tinplate.....	148, 852	108, 500	241, 854	199, 495
Metals, various.....	42, 830	30, 662	60, 140	175, 066
Automobiles.....	66, 673	50, 731	90, 111	131, 341
Canned goods (fish, fruit, vegetables, etc.).....	117, 857	101, 751	106, 869	121, 478
Asphalt and tar.....	60, 286	47, 748	61, 581	113, 305
Machinery.....	78, 656	54, 781	87, 285	112, 339
Corn.....	59, 987	128, 331	42, 241	104, 783
Cement.....	76, 870	69, 105	85, 456	103, 808
Chemicals.....	72, 436	64, 072	87, 652	98, 907
Coal and coke.....	95, 199	85, 548	110, 294	97, 582
Ores, various.....	31, 164	28, 053	27, 572	97, 502
Textiles.....	83, 756	78, 555	98, 269	96, 269
Automobile accessories.....	39, 367	35, 237	65, 217	79, 818
Ammonium compounds.....	71, 933	35, 002	56, 331	76, 073
Liquors and wines.....	18, 802	15, 431	25, 972	60, 034
Nitrate.....	36, 980	45, 295	69, 164	58, 464
Salt.....	36, 855	30, 263	60, 018	53, 931
Glass and glassware.....	44, 911	47, 374	51, 548	53, 824
Coffee.....	61, 241	54, 491	64, 624	52, 670
Tobacco.....	65, 806	67, 548	72, 006	52, 611
Sugar.....	58, 671	40, 256	75, 770	50, 052
Rosin.....	45, 405	38, 024	43, 834	47, 527
Wood pulp.....	23, 397	38, 986	38, 947	45, 222
Oils, vegetable.....	33, 739	39, 132	38, 751	39, 434
Cresote.....	38, 482	15, 315	14, 626	38, 395
Agricultural implements.....	12, 956	11, 567	25, 246	32, 037
Sand.....	14, 392	23, 519	31, 225	31, 967
Railroad material.....	26, 731	18, 265	42, 350	28, 125
Lumber and mill products.....	26, 319	21, 826	27, 729	26, 776
Paints and varnishes.....	11, 813	8, 676	14, 740	26, 265
Soda and sodium compounds.....	35, 758	25, 892	32, 484	25, 909

Commodity movement—Continued

Commodity	Fiscal year ended June 30—			
	1932	1933	1934	1935
ATLANTIC TO PACIFIC—continued				
Soap and products.....	<i>Long tons</i> 35, 289	<i>Long tons</i> 28, 631	<i>Long tons</i> 24, 505	<i>Long tons</i> 23, 746
All other.....	1, 181, 655	884, 587	1, 008, 159	1, 095, 438
Total.....	5, 631, 717	4, 507, 070	6, 162, 649	7, 529, 721
PACIFIC TO ATLANTIC				
Mineral oils.....	3, 116, 844	3, 506, 356	5, 443, 271	4, 342, 231
Lumber.....	2, 129, 787	1, 549, 483	2, 148, 020	2, 165, 835
Wheat.....	1, 790, 530	2, 368, 892	1, 371, 258	1, 533, 056
Sugar.....	1, 298, 830	1, 667, 496	1, 773, 137	1, 212, 145
Nitrate.....	811, 522	186, 783	1, 059, 425	1, 146, 848
Ores.....	618, 368	90, 518	1, 224, 135	1, 080, 144
Canned goods (fish, fruit, vegetables, etc.).....	787, 736	865, 716	882, 254	937, 172
Metals, various.....	472, 560	376, 396	511, 759	608, 122
Soybeans.....	—	59, 593	206, 605	433, 322
Food products in cold storage ¹	248, 874	162, 143	357, 058	363, 745
Flour.....	123, 964	180, 858	270, 531	319, 655
Fruit, fresh.....	256, 563	285, 523	311, 530	270, 666
Fruit, dried.....	340, 851	314, 061	307, 714	261, 116
Barley.....	153, 206	209, 890	197, 183	200, 030
Oils, vegetable.....	112, 401	95, 473	154, 710	193, 470
Oats.....	108, 089	79, 898	90, 034	155, 881
Coffee.....	125, 228	152, 735	140, 907	137, 081
Beans, edible, dry.....	172, 526	103, 522	128, 473	130, 649
Wood pulp.....	157, 541	106, 329	135, 214	129, 771
Wool.....	101, 147	97, 852	155, 627	122, 234
Paper and paper products.....	116, 103	98, 997	110, 095	118, 588
Copra.....	79, 471	80, 789	103, 904	102, 397
Borax.....	75, 463	66, 205	80, 512	94, 716
Rice.....	53, 924	34, 267	47, 128	81, 192
Cotton, raw.....	62, 005	64, 931	78, 018	78, 282
Fish meal.....	—	6, 037	40, 694	75, 593
Molasses and sirups.....	31, 975	7, 667	46, 485	66, 517
Skins and hides.....	53, 619	52, 509	62, 271	64, 123
All other.....	768, 142	803, 176	1, 103, 408	1, 355, 225
Total.....	14, 167, 269	13, 654, 095	18, 541, 360	17, 779, 806

¹ Does not include fresh fruit.

CLASSIFICATION OF VESSELS

LADEN AND BALLAST TRAFFIC

The following summarizes the ocean-going commercial traffic through the Canal during the fiscal year 1935 by laden ships and those in ballast, segregated between tankers, general cargo, and those not designed to carry cargo, and between United States and all other nationalities:

Classification	United States traffic			Foreign traffic			Total traffic		
	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total
Tank ships, laden:									
Number of transits.....	36	227	263		158	183	61	385	446
Panama Canal net tonnage.....	171,203	1,317,957	1,489,160	126,459	970,192	1,096,651	297,662	2,298,149	2,585,811
United States equivalent net tonnage.....	140,827	1,076,694	1,217,521	108,909	823,654	932,563	249,736	1,900,348	2,150,084
Tolls.....	\$176,033.75	\$1,345,013.15	\$1,521,046.90	\$136,110.95	\$1,029,453.15	\$1,165,564.10	\$312,144.70	\$2,375,066.30	\$2,687,211.00
Cargo (tons).....	207,691	2,513,183	2,720,874	232,303	1,961,325	2,194,028	440,194	4,474,708	4,914,902
Tank ships, ballast:									
Number of transits.....	187	5	192	147	6	153	334	11	345
Panama Canal net tonnage.....	1,104,953	19,219	1,124,172	940,778	26,000	966,778	2,045,731	45,219	2,090,950
United States equivalent net tonnage.....	902,594	16,042	918,636	797,006	22,617	819,623	1,689,000	38,659	1,738,259
Tolls.....	\$795,719.07	\$13,837.68	\$809,556.75	\$677,360.16	\$18,735.18	\$696,095.34	\$1,473,079.23	\$32,572.86	\$1,505,652.09
All other cargo ships laden:									
Number of transits.....	812	816	1,628	1,104	1,263	2,367	1,916	2,079	3,995
Panama Canal net tonnage.....	4,783,726	4,665,942	9,449,668	5,723,754	6,326,570	12,050,324	10,507,480	10,992,512	21,499,992
United States equivalent net tonnage.....	3,109,356	3,082,380	6,191,736	3,802,115	4,322,676	8,124,791	6,911,471	7,405,056	14,316,527
Tolls.....	\$3,886,051.01	\$3,851,598.95	\$7,737,649.96	\$4,752,306.95	\$5,402,440.30	\$10,150,747.25	\$8,038,337.96	\$9,254,039.25	\$17,892,397.21
Cargo (tons).....	2,778,409	5,326,290	8,104,699	4,311,118	7,978,808	12,289,926	7,089,327	13,305,098	20,394,625
All other cargo ships, ballast:									
Number of transits.....	44	2	46	303	4	307	347	6	353
Panama Canal net tonnage.....	186,181	6,665	192,846	1,410,385	12,713	1,423,098	1,596,566	19,378	1,615,944
United States equivalent net tonnage.....	154,314	5,015	159,329	1,044,434	8,595	1,053,029	1,198,748	13,610	1,212,358
Tolls.....	\$134,822.55	\$4,798.80	\$139,621.65	\$1,012,685.39	\$9,153.36	\$1,021,838.75	\$1,147,508.24	\$13,952.16	\$1,161,460.40
Miscellaneous:									
Naval vessels:									
Number of transits.....				8	13	21	8	13	21
Displacement tonnage.....				31,511	70,048	101,559	31,511	70,048	101,559
Tolls.....				\$15,755.50	\$35,024.00	\$50,779.50	\$15,755.50	\$35,024.00	\$50,779.50
Yachts:									
Number of transits.....	7	7	14	1	---	---	8	7	15
Panama Canal net tonnage.....	5,138	4,810	9,948	818	---	---	5,956	4,810	10,766
United States equivalent net tonnage.....	4,558	4,292	8,850	567	---	---	5,125	4,292	9,417
Tolls.....	\$3,756.42	\$3,520.26	\$7,276.68	\$588.96	---	---	\$4,345.38	\$3,520.26	\$7,865.64

Classification	United States traffic			Foreign traffic			Total traffic		
	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total	Atlantic to Pacific	Pacific to Atlantic	Total
Miscellaneous—Continued.									
Dredges:									
Number of transits.									
Panama Canal net tonnage.									
United States equivalent net tonnage.									
Tolls.									
Training ships:									
Number of transits.									
Panama Canal net tonnage.									
United States equivalent net tonnage.									
Tolls.									
Tugs:									
Number of transits.									
Panama Canal net tonnage.									
United States equivalent net tonnage.									
Tolls.									
SUMMARY									
Total cargo ships laden:									
Number of transits.	848	1,043	1,891	1,129	1,421	2,550	1,977	2,464	4,441
Panama Canal net tonnage.	4,954,929	5,983,899	10,938,828	5,850,213	7,296,762	13,146,975	10,805,142	13,280,601	24,085,803
United States equivalent net tonnage.	3,250,183	4,159,074	7,409,257	3,911,024	5,146,330	9,057,354	7,161,207	9,305,404	16,466,611
Tolls.	\$4,062,084.76	\$5,197,212.10	\$9,259,296.86	\$4,888,417.90	\$6,431,893.45	\$11,320,311.35	\$8,950,502.66	\$11,629,105.55	\$20,579,008.21
Cargo (tons)	2,986,100	7,839,473	10,825,573	4,543,621	9,940,333	14,483,954	7,529,721	17,779,806	25,309,527
Total cargo ships, ballast:									
Number of transits.	231	7	238	450	10	460	681	17	698
Panama Canal net tonnage.	1,291,134	25,884	1,317,018	2,351,163	38,713	2,389,876	3,642,297	64,597	3,706,894
United States equivalent net tonnage.	1,056,908	21,057	1,077,965	1,841,440	31,212	1,872,652	2,898,348	52,269	2,950,617
Tolls.	\$930,541.92	\$18,636.48	\$949,178.40	\$1,690,045.55	\$27,868.54	\$1,717,934.09	\$2,620,587.47	\$46,525.02	\$2,667,112.49
Total tank ships:									
Number of transits.	223	232	455	172	164	336	395	396	791
Panama Canal net tonnage.	1,276,156	1,337,176	2,613,332	1,067,237	996,192	2,063,429	2,343,393	2,333,368	4,676,761
United States equivalent net tonnage.	1,043,421	1,092,736	2,136,157	905,915	846,271	1,752,186	1,949,336	1,939,007	3,888,343

Tolls.....	\$971,752.82	\$1,359,450.83	\$2,331,203.65	\$813,471.11	\$1,048,188.33	\$1,861,650.44	\$1,785,223.93	\$2,407,639.16	\$4,192,863.02
Cargo (tons).....	207,691	2,513,183	2,720,874	232,503	1,961,525	2,194,028	440,194	4,474,708	4,914,902
Total all other cargo ships:									
Number of transits.....	856	818	1,674	1,407	1,267	2,674	2,263	2,085	4,848
Panama Canal net tonnage.....	4,969,907	4,672,607	9,642,514	7,134,139	6,339,283	13,473,422	12,104,046	11,011,890	23,115,856
United States equivalent net tonnage.....									
Tolls.....	3,263,670	3,087,395	6,351,065	4,816,549	4,331,271	9,177,890	8,110,219	7,418,066	15,528,885
Cargo (tons).....	\$4,020,873.86	\$3,856,397.75	\$7,877,271.61	\$5,764,992.34	\$5,411,698.60	\$11,176,580.00	\$9,785,806.20	\$9,267,991.41	\$19,053,857.61
Total miscellaneous ships:									
Number of transits.....	7	7	14	11	16	27	18	23	41
Panama Canal net tonnage.....	5,138	4,810	9,948	1,734	1,209	2,943	6,872	6,019	12,891
United States equivalent net tonnage.....									
Displacement tonnage.....	4,558	4,292	8,850	1,439	1,141	2,580	5,997	5,433	11,430
Tolls.....	\$3,756.42	\$3,320.26	\$7,276.08	\$17,171.07	\$35,894.48	\$53,065.55	\$20,927.49	\$39,414.74	\$60,342.23
Grand total:									
Number of transits.....	1,086	1,057	2,143	1,590	1,447	3,037	2,676	2,504	5,180
Panama Canal net tonnage.....	6,254,201	6,014,593	12,265,791	8,203,110	7,336,684	15,539,794	14,454,311	13,351,277	27,805,588
United States equivalent net tonnage.....									
Displacement tonnage.....	4,311,649	4,184,423	8,496,072	5,753,903	5,178,683	10,932,556	10,065,552	9,363,106	19,428,658
Tolls.....	\$4,996,383.10	\$5,219,368.84	\$10,215,751.94	\$6,595,634.52	\$6,495,676.47	\$13,091,310.99	\$11,592,017.62	\$11,715,045.31	\$23,307,062.93
Cargo (tons).....	2,986,100	7,839,473	10,825,573	4,543,621	9,940,333	14,483,954	7,529,721	17,779,806	25,399,527

BALLAST AND LADEN TRAFFIC BY NATIONALITY

In the table below, which shows traffic through the Canal by flag, the ships of each nationality have been segregated to show separate statistics on vessels which were carrying cargo at the time of transiting the Canal and those which transited the Canal in ballast.

Ballast

	Number of transits	Tonnage				Tolls
		Panama Canal, net	United States equivalent	Registered		
				Gross	Net	
British.....	200	1,085,696	834,016	1,392,099	828,176	\$781,368.98
Chilean.....	1	316	288	749	375	227.52
Colombian.....	1	540	516	700	500	388.80
Danish.....	20	98,219	66,099	107,281	66,047	69,943.71
Danzig.....	22	175,337	149,582	267,127	151,380	126,242.64
Finnish.....	1	4,649	3,886	6,549	2,816	3,347.28
French.....	11	65,071	55,818	87,181	50,441	46,851.12
German.....	24	113,411	83,408	135,711	80,461	81,655.92
Greek.....	5	20,956	17,146	25,680	15,771	15,174.99
Italian.....	12	56,507	47,460	80,364	46,360	40,685.04
Japanese.....	18	86,951	74,782	110,509	74,048	62,646.93
Netherland.....	5	26,615	20,429	33,185	19,924	19,162.80
Norwegian.....	101	487,838	381,621	630,670	279,551	349,523.70
Panamanian.....	10	25,570	22,323	44,606	22,293	18,486.30
Peruvian.....	3	2,913	2,697	4,657	2,703	2,115.87
Polish.....	1	563	535	1,561	525	405.36
Swedish.....	28	134,474	109,332	346,607	130,331	96,631.95
United States.....	252	1,326,966	1,086,815	1,782,613	1,082,719	956,455.08
Venezuelan.....	1	1,081	1,058	2,042	1,080	793.50
Yugoslav.....	1	5,759	3,899	6,361	3,850	4,146.48
Total.....	717	3,719,432	2,961,710	5,066,252	2,959,351	2,676,253.97

Laden

British.....	959	5,549,515	3,884,291	6,527,077	3,956,548	\$4,855,198.45
Chilean.....	12	43,649	33,721	58,506	34,825	42,034.60
Danish.....	105	495,278	318,063	538,882	331,081	397,578.75
Danzig.....	27	212,840	180,366	327,602	182,151	225,457.50
Finnish.....	2	9,904	7,426	12,334	7,275	9,282.50
French.....	101	596,641	382,942	712,222	397,775	478,677.50
German.....	316	1,203,374	824,893	1,403,895	840,924	1,030,887.95
Greek.....	10	41,406	30,080	49,289	30,208	37,600.00
Italian.....	65	431,173	285,287	533,101	315,392	356,608.75
Japanese.....	237	1,396,658	1,050,144	1,693,229	1,041,670	1,312,161.95
Netherland.....	109	521,625	349,559	587,730	354,055	436,948.75
Norwegian.....	414	1,991,362	1,277,471	2,143,004	1,291,312	1,596,693.25
Panamanian.....	93	178,558	108,543	201,713	108,378	135,552.25
Peruvian.....	3	3,616	3,325	4,964	2,782	4,100.70
Swedish.....	83	411,733	274,192	627,209	339,729	342,740.00
United States.....	1,891	10,938,828	7,409,257	12,450,433	7,368,599	9,259,296.86
Venezuelan.....	1	1,081	1,058	2,042	1,080	1,297.20
Yugoslav.....	14	58,915	46,330	73,972	46,191	57,912.50
Total.....	4,442	24,086,156	16,466,948	27,947,104	16,649,925	20,580,029.46

NOTE.—21 vessels paying on displacement tonnage are not included in above statements.

AVERAGE TONNAGE, TOLLS, AND TONS OF CARGO PER CARGO-CARRYING VESSEL

The average measurement tonnage, tolls, and tons of cargo per cargo-carrying vessel of 300 net tons and over, Panama Canal meas-

urement, transiting the Panama Canal during the past 3 years are shown in the following tabulation:

	Fiscal year 1933	Fiscal year 1934	Fiscal year 1935
Measured tonnage:			
Panama Canal net.....	5,504	5,482	5,405
United States net.....	3,946	3,903	3,776
Registered gross.....	6,553	6,592	6,416
Registered net.....	3,987	3,940	3,811
Tolls.....	\$4,726.24	\$4,611.57	\$4,522.93
Tons of cargo (including vessels in ballast).....	4,385	4,744	4,921
Tons of cargo (laden vessels only).....	5,255	5,831	5,703

NOTE.—Computation of above averages is based on cargo-carrying vessels only; craft not engaged in commerce, such as yachts, naval vessels, etc., are not considered.

STEAM, MOTOR, AND OTHER VESSELS

Of the 5,180 ocean-going commercial vessels transiting the Canal during the fiscal year, 3,386 were steamers, 1,753 were motorships, and the remainder, 41, were unclassified naval vessels, yachts, etc. For the past 5 years the proportions of these classes have been as follows:

	1931	1932	1933	1934	1935
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Steamers.....	71.1	67.0	63.2	65.6	63.4
Motorships.....	28.4	32.4	36.4	33.9	33.8
Miscellaneous.....	.5	.6	.4	.5	.8
Total.....	100.0	100.0	100.0	100.0	100.0

Of the 3,386 steamers transiting the Canal during the past fiscal year, 2,532 burned oil, 823 burned coal, and 31 were reported as fitted for either fuel. For the past 5 years the proportions of each class have been as follows:

	1931	1932	1933	1934	1935
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Oil burning.....	72.8	76.1	70.6	76.2	74.8
Coal burning.....	25.6	22.1	27.2	22.6	24.3
Either oil or coal.....	1.6	1.8	2.2	1.2	.9
Total.....	100.0	100.0	100.0	100.0	100.0

SUMMARY OF PASSENGER MOVEMENT AT CANAL DURING 1935

The following tabulation shows by months the number of passengers disembarking and embarking at Canal Zone ports during the fiscal year 1935, segregated as between first-class and "others", with comparative totals for the fiscal years 1934 and 1933:

	Disembarking			Embarking		
	First class	Others	Total	First class	Others	Total
July.....	1,421	689	2,110	2,119	1,666	3,785
August.....	1,753	1,913	3,666	1,192	1,671	2,863
September.....	1,923	1,984	3,907	1,593	1,395	2,988
October.....	1,784	1,968	3,752	1,236	953	2,189
November.....	1,424	839	2,263	1,242	1,088	2,330
December.....	1,500	2,197	3,697	1,139	1,947	3,086
January.....	1,417	768	2,185	1,209	844	2,053
February.....	1,382	1,270	2,652	1,312	1,117	2,429
March.....	1,366	1,671	3,037	1,605	2,038	3,643
April.....	1,222	1,428	2,650	1,491	1,147	2,638
May.....	1,282	904	2,186	1,765	1,259	3,024
June.....	1,689	1,043	2,732	1,800	1,691	2,891
Total, 1935.....	18,163	16,674	34,837	17,703	16,216	33,919
Total, 1934.....	16,646	12,182	28,828	16,463	13,509	29,972
Total, 1933.....	14,153	11,859	26,012	14,445	13,869	28,314

As compared with 1934, the fiscal year 1935 shows a 20.8-percent increase in the number of arrivals, and in comparison with 1933 a 33.9-percent increase; in the number of departures there was an increase of 13.2 percent over 1934 and a 19.8-percent increase as against 1933.

The following table shows the passenger traffic through the ports of Cristobal and Balboa during the past 3 years:

	Port of Cristobal			Port of Balboa		
	1933	1934	1935	1933	1934	1935
Passengers disembarking.....	17,583	18,898	22,693	8,429	9,930	12,144
Passengers embarking.....	19,444	19,156	21,053	8,870	10,816	12,866

A further segregation of the passenger movement shows that 25,233 incoming and 23,369 outgoing passengers were brought from or were destined to ports of the Atlantic, and 9,604 incoming and 10,550 outgoing passengers were brought from or were destined to ports of the Pacific.

TRANSIENT PASSENGERS

In addition to the figures shown above of passengers disembarking and embarking, there were 120,906 transient passengers brought to the Isthmus by vessels calling at Canal ports during the fiscal year 1935. For the fiscal year 1934, this number was 101,934, and in the fiscal year 1933, 95,628. The number in 1935 increased 18,972, or 18.6 percent in comparison with those in 1934, and in comparison with those in 1933 an increase of 25,278, or 26.4 percent. Most of these passengers came ashore for a short period, but as they departed on the vessel on which they arrived they are not included in the tabulation of passengers ending or beginning a voyage at the Isthmus. The

origin and destination of these transient passengers are indicated in the following tabulation:

	Total		Fiscal year 1935		
	1933	1934	Cristobal	Balboa	Total
Remaining on board vessels transiting Canal:					
Atlantic to Pacific.....	38,963	38,114	49,711	-----	49,711
Pacific to Atlantic.....	29,873	31,390	-----	39,336	39,336
Remaining on board vessels entering port, but not transiting Canal:					
Atlantic to Atlantic ports.....	25,510	30,804	29,165	-----	29,165
Pacific to Pacific ports.....	1,282	1,626	-----	2,694	2,694
Total.....	95,628	101,934	78,876	42,030	120,906

NOTE.—In passengers "remaining on board vessels transiting Canal", those from the Atlantic to the Pacific are taken up at Cristobal, and those from the Pacific to the Atlantic at Balboa, that is, at the port of arrival from sea, and not again at the other terminus of the Canal.

Included among the transient passengers were a number visiting the Canal as members of tourist cruises, many of whom crossed the Isthmus in sight-seeing parties by special train in connection with a boat trip through Gaillard Cut. During the past year 57 boat trips were made, carrying 7,968 passengers.

FREQUENCY OF TRANSITS OF VESSELS THROUGH THE PANAMA CANAL

During the fiscal year 1935, 1,379 individual ocean-going commercial vessels, representing 21 nationalities, passed through the Panama Canal; in the aggregate, these vessels made a total of 5,180 transits. The number of transits made by individual ships varied from 1 to 63, and averaged 3.75. The 63 transits were made by the small Panamanian steamer *Istmo*, plying between Cristobal and the west coast of Colombia.

Although vessels of United States registry led in the aggregate number of transits during the year, Great Britain, which ranked second in transits, led in the number of individual vessels, with 457. The number of individual vessels of United States registry which passed through during the year was 383.

The following table shows the number of individual ships, the frequency of transits per vessel, the total transits for the year, and the average number of transits per individual vessel, segregated by nationality.

Vessels making indicated number of transits per vessel during fiscal year 1935

Nationality	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	25	26	27	28	29	31	32	34	36	Total ships	Total trans- its	Aver- age num- ber of trans- its
British.....	107	143	43	40	22	32	3		1	1	3													1	1						457	1,170	2.55	
Chilean.....	3	1		2																											6	13	2.17	
Colombian.....	15	7	4	6	3	2	1	2		1																					1	1	1.00	
Danish.....	9	3	2	3	1	3																									41	125	3.05	
Danzig.....	1	1																													14	49	3.50	
Finnish.....	6	5	1	7	4	3	1	3																						2	3	1.50		
French.....	23	20	7	8	7	7	5																								30	116	3.87	
German.....	2	2	1	2	3	2																				1		1			81	341	4.21	
Greek.....	5	7	2	1	3	2	1																								6	15	2.50	
Italian.....	2	2	1	3	2	1			2																						23	77	3.35	
Japanese.....	18	13	7	20	4	15																									77	255	3.31	
Netherlands.....	4	6				1	6	3																							21	114	5.43	
Norwegian.....	68	39	21	14	6	7	4	9	2	6																					176	515	2.93	
Panamanian.....	1	3		1	2	2	1																								1	103	9.36	
Peruvian.....	2	4																													6	10	1.67	
Polish.....	1																														1	1	1.00	
Spanish.....	1																														1	1	1.00	
Swedish.....	11	6	2	1	1	5	1																								29	111	3.83	
United States.....	27	73	26	37	30	62	36	32	22	13	3	3	3	1	2	3	6	1	1	1	1	1	1							383	2,143	5.60		
Venezuelan.....	1																															1	2	2.00
Yugoslav.....	9	3																														12	15	1.25
Total, 1935.....	367	337	116	142	83	147	55	46	27	21	6	3	3	1	2	3	7	1	1	1	1	1	1	0	3	1	0	1	0	1	1	1,379	5,180	3.75
Total, 1934.....	318	337	124	156	94	120	65	42	29	16	7	12	8	2	3	4	4	1	2	0	1	1	1	1	1	0	1	2	1	0	1	1,353	5,234	3.87

The following tabulation shows for the fiscal year 1935 the number of vessels making the indicated number of transits through the Panama Canal, the percent which each class formed of the total number of individual vessels (1,379), their aggregate number of transits, and their percent of the total ocean-going commercial transits (5,180):

Number of transits	Number of vessels	Percent of individual vessels (1,379)	Total number of transits	Percent of total Canal transits (5,180)	Number of transits	Number of vessels	Percent of individual vessels (1,379)	Total number of transits	Percent of total Canal transits (5,180)
1.....	367	26.6	367	7.1	16.....	3	.2	48	0.9
2.....	337	24.3	674	13.0	17.....	7	.5	119	2.3
3.....	116	8.4	348	6.7	18.....	1	.1	18	.3
4.....	142	10.3	568	11.0	19.....	1	.1	19	.4
5.....	83	6.0	415	8.0	20.....	1	.1	20	.4
6.....	147	10.7	882	17.0	22.....	1	.1	22	.4
7.....	55	4.0	385	7.4	24.....	1	.1	24	.5
8.....	46	3.3	368	7.1	26.....	3	.2	78	1.5
9.....	27	2.0	243	4.7	27.....	1	.1	27	.5
10.....	21	1.5	210	4.1	29.....	1	.1	29	.6
11.....	6	.4	66	1.3	32.....	1	.1	32	.6
12.....	3	.2	36	.7	36.....	1	.1	36	.7
13.....	3	.2	39	.8	63.....	1	.1	63	1.1
14.....	1	.1	14	.3					
15.....	2	.1	30	.6					
					Total...	1,379	100.0	5,180	100.0

NET TONNAGE OF VESSELS

The 5,180 ocean-going commercial vessels which transited the Canal in the fiscal year 1935 were comprised of 5,159 merchant vessels, yachts, etc., paying on the basis of net tonnage, and 21 naval vessels paying tolls on the basis of displacement tonnage. Of the 5,159 ocean-going commercial transits paying tolls on net tonnage, 53.4 percent were of vessels of from 4,000 to 6,000 net tons, Panama Canal measurement. Vessels under 1,000 net tons equaled 4.5 percent of the transits, and 3.3 percent were by vessels of 10,000 tons and over. The average tonnage of all transits was 5,390 as compared with 5,474 in the previous fiscal year, a decrease of 1.5 percent.

The following tabulation shows the ocean-going commercial vessels, excluding naval vessels, in groups according to net tonnage, Panama Canal measurement, segregated by nationality, with average tonnages and group percentages for the fiscal years 1935 and 1934.

Number of transits in net tonnage groups

Nationality	300 to 999, in- clusive	1,000 to 1,999, in- clusive	2,000 to 2,999, in- clusive	3,000 to 3,999, in- clusive	4,000 to 4,999, in- clusive	5,000 to 5,999, in- clusive	6,000 to 6,999, in- clusive	7,000 to 7,999, in- clusive	8,000 to 8,999, in- clusive	9,000 to 9,999, in- clusive	10,000 and over	Total ¹	Panama Canal net tonnage	Average Pana- ma Canal net tonnage	
														Fiscal year 1935	Fiscal year 1934
British.....	53	3	21	47	387	274	126	93	61	38	56	1, 159	6, 635, 211	5, 725	5, 721
Chilean.....	1	1	---	7	4	---	---	---	---	---	---	1	43, 965	3, 819	3, 801
Colombian.....	1	---	---	---	---	---	---	---	---	---	---	1	540	540	307
Danish.....	---	28	4	6	32	25	9	---	21	---	---	125	593, 497	4, 748	4, 788
Finnish.....	---	---	---	---	2	1	---	20	28	---	---	49	388, 177	7, 922	7, 987
French.....	---	---	---	---	50	14	10	38	---	---	---	3	14, 553	4, 851	4, 544
German.....	63	68	13	13	28	54	82	18	---	---	---	112	661, 712	5, 908	5, 710
Greek.....	---	---	---	2	13	---	---	---	---	---	---	340	1, 316, 785	3, 873	3, 532
Italian.....	---	---	---	7	20	1	26	---	3	20	---	15	62, 362	4, 537	4, 136
Japanese.....	---	---	---	3	36	89	119	5	---	---	---	77	487, 680	6, 333	7, 086
Netherlands.....	36	---	3	3	2	17	28	18	13	---	---	255	1, 483, 009	5, 818	5, 478
Norwegian.....	---	---	---	---	163	126	93	13	---	---	---	114	548, 240	4, 809	5, 883
Panamanian.....	64	4	6	12	6	---	17	---	---	---	---	515	2, 479, 200	4, 814	4, 971
Peruvian.....	3	3	---	---	---	---	---	---	---	---	---	103	204, 128	1, 982	2, 406
Polish.....	1	---	---	---	---	---	---	---	---	---	---	6	6, 529	1, 088	2, 546
Russian.....	---	---	---	---	---	---	---	---	---	---	---	1	563	---	---
Swedish.....	---	---	1	1	64	39	3	3	---	---	---	111	546, 207	4, 921	4, 668
United States.....	10	21	132	71	679	624	308	62	44	80	112	2, 143	12, 265, 794	5, 724	5, 852
Venezuelan.....	---	2	---	---	---	---	---	---	---	---	---	2	2, 162	1, 081	846
Yugoslav.....	---	---	---	3	11	1	---	---	---	---	---	15	64, 674	4, 312	4, 610
Total.....	232	145	231	226	1, 491	1, 266	821	270	170	138	169	5, 159	27, 805, 588	5, 390	5, 474
Percent of total:	4.5	2.8	4.5	4.4	28.9	24.5	15.9	5.2	3.3	2.7	3.3	100.0	---	---	---
1935.....	3.8	3.0	3.3	3.8	29.9	25.4	15.2	5.6	4.1	2.5	3.4	100.0	---	---	---
1934.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

¹ 21 naval vessels—11 British, 4 French, 1 German, 4 Peruvian, and 1 Spanish—paying tolls on displacement tonnage are not included.

DUAL MEASUREMENT SYSTEM

The Panama Canal Act, August 24, 1912, authorizes the President to prescribe and from time to time to change the tolls that should be levied by the United States for the use of the Panama Canal. This act provides that if the tolls are not based upon net registered tonnage, they should not exceed \$1.25 per net registered ton as nearly as the same may be determined, nor be less than the equivalent of 75 cents per registered ton.

Pursuant to the authority vested in him by Congress, the President issued a proclamation under date of November 13, 1912, which established toll rates on commercial ships as follows:

1. On merchant vessels carrying passengers or cargo, \$1:20 per net vessel-ton, each 100 cubic feet, of actual earning power.
2. On vessels in ballast without passengers or cargo 40 percent less than the rate of tolls for vessels with passengers or cargo.

Under date of November 21, 1913, the President by further proclamation prescribed and proclaimed that vessels using the Panama Canal should pay tolls on the basis of the "Rules for the Measurement of Vessels for the Panama Canal", these rules having been carefully devised with a view to determining the actual earning capacity of ships using the Canal.

Tolls on vessels passing through the Canal were collected on the basis of the Panama Canal rules of measurement for some time after the opening of the Canal but, subsequently, upon a protest of certain shipowners regarding charges on deck cargo, the question of the interpretation of the act of Congress was referred to the Attorney General for decision. He decided that the term "net registered tonnage" as used in the act must be interpreted to mean the net tonnage of a vessel as measured under the rules prescribed by the statutes of the United States.

The effect of the above is that tolls on commercial vessels using the Canal are levied at the rate of \$1.20 per net ton on laden ships and \$0.72 per net ton on vessels in ballast on the basis of tonnage determined by the Panama Canal rules of measurement with the proviso that the amount collectible shall not exceed \$1.25 per net ton or be less than \$0.75 per net ton as determined under the rules of registry in the United States. This requires that tonnage be determined and tolls reckoned on two bases.

The Canal administration has been endeavoring over a period of years to secure legislation which would eliminate the United States registry measurement rules as a factor in the computation of tolls charges on vessels using the Canal. The need for this legislation is discussed at some length in section III of this report.

The Panama Canal rules of measurement were devised for the express purpose of providing a just and equitable basis for the levying

of tolls on vessels using the Canal. The United States registry rules were not so devised and are unsatisfactory for this purpose. The unsuitability of the United States registry rules as a basis for the levying of tolls is amply illustrated by the fact that during the period from 1917 to the present, when the net tonnages of vessels passing through the Canal have been checked under both the Panama Canal and the United States registry systems of measurement, the percentage which the aggregate United States registry measurement tonnage has formed of the Panama Canal net tonnage has declined from 81.08 to 69.87 percent. During this period the Panama Canal rules have not been changed and the Panama Canal net tonnage has therefore remained a constant factor. On the other hand, through structural alterations that have not appreciably affected the earning capacity of their vessels, shipowners have materially reduced the net tonnage of their vessels under the United States registry measurement rules. Through such alterations and the construction of new ships designed with the view to keeping the United States registry measurement tonnage at a minimum, during the past 18 years the aggregate United States registry measurement tonnage has declined approximately 11 percent in relation to the Panama Canal net tonnage.

With a view to estopping the progressive lowering of the ratio between actual earning capacity and the net tonnage as determined under the United States registry measurement rules, several years ago the Canal administration suggested the adoption of rates of \$1 per Canal net ton for laden ships and 60 cents per net ton for ships in ballast. The application of these rates to ships which passed through the Canal during 1927 would have resulted in the collection of less tolls from vessels of United States registry than were paid under the dual measurement system while vessels of foreign registry would have paid slightly more. Through the progressive lowering of net tonnage under the United States rules, however, by 1935 the application of rates of \$1 for laden vessels and \$0.60 for vessels in ballast, collected on the basis of Panama Canal net tonnage, would have resulted in vessels of all nationalities passing through the Canal in 1935 paying additional tolls of more than \$3,000,000 as compared with the amount collected under the dual measurement system.

For the tonnage passing through the Canal since 1927, the following tabulation shows a comparison between the tolls actually collected under the dual measurement system and the tolls that would have been paid had tolls been levied on Canal net tonnage at rates of \$1 per ton on laden ships and \$0.60 per ton on ships in ballast. The table shows tolls collections segregated between vessels of United States and of foreign registry. It is to be noted that under the dual

measurement system, the revenues lost to the United States have benefited foreign shipowners more than United States shipowners.

Vessels of United States registry

	Tolls actually collected	Tolls which would have been collected on proposed basis	Increase	
			Actual	Percent
1927-----	\$12,718,197.86	\$12,600,033.20	¹ \$118,164.66	10.93
1928-----	12,643,384.83	12,660,458.80	17,073.97	.14
1929-----	12,296,133.14	12,468,843.00	172,709.86	1.40
1930-----	13,218,921.62	13,535,946.60	317,024.98	2.40
1931-----	11,424,020.30	11,881,786.80	457,766.50	4.00
1932-----	9,747,560.20	10,410,494.00	662,933.80	6.80
1933-----	8,932,421.97	9,669,616.40	737,194.43	8.25
1931-----	11,186,127.95	12,368,245.00	1,182,117.05	10.67
1935-----	10,215,751.94	11,735,007.60	1,519,255.66	14.87

Vessels other than of United States registry

1927-----	\$11,494,052.75	\$11,708,056.90	\$214,004.15	1.86
1928-----	14,278,815.92	14,563,251.70	284,435.78	1.99
1929-----	14,814,932.33	15,508,063.60	693,071.27	4.68
1930-----	13,841,077.32	14,782,136.90	941,059.58	6.80
1931-----	13,200,579.46	14,248,691.00	1,048,112.44	7.94
1932-----	10,947,144.41	12,027,411.80	1,080,267.39	9.87
1933-----	10,668,655.20	11,760,508.60	1,091,853.40	10.23
1934-----	12,861,055.49	14,119,508.40	1,258,452.91	9.78
1935-----	13,091,310.99	14,633,587.10	1,542,276.11	11.78

¹ Decrease.

The tolls paid by the vessels of various nationalities using the Canal during the fiscal year 1935 are shown in the following table, in comparison with the tolls which they would have paid on the basis of \$1 per Canal net ton for laden ships and 60 cents for vessels in ballast. In this table the traffic has been segregated to show general cargo and cargo/passenger vessels, and the total of all commercial traffic; the latter includes, in addition to the general cargo and cargo/passenger vessels, oil tankers, and miscellaneous non-cargo-carrying vessels such as yachts, foreign naval vessels, etc. There is also shown the average per Panama Canal net ton of the tolls which were actually collected on laden and ballast traffic for the various nationalities.

On the assumption that the Panama Canal rules for the determination of net tonnage are an accurate basis for the just levy of Canal dues, it is obvious that the present use of the United States rules is resulting in inequities and injustices, since the ships are not paying at equal rates on net tonnage as determined under the Canal rules of measurement, i. e., on their earning capacity. The table follows:

Nationality	Tolls actually collected under present dual system		Tolls that would have been collected under proposed rates of \$1 laden and \$0.60 ballast, on basis of Panama Canal net tonnage		Difference				Pro rata per Panama Canal net ton on tolls actually collected	
	General cargo and cargo/ passenger	Total traffic	General cargo and cargo/ passenger	Total traffic	Increase		Decrease		Laden	Ballast
					General cargo and cargo/ passenger	Total traffic	General cargo and cargo/ passenger	Total traffic		
British.....	\$4,847,882.17	\$5,671,310.93	\$5,495,429.80	\$6,235,676.10	\$647,547.63	\$554,365.17			\$0.857	\$0.720
Chilean.....	42,034.60	42,262.12	43,649.00	43,838.60	1,614.40	1,576.48			.963	.720
Colombian.....		388.80		324.00						
Danish.....	423,175.01	467,522.46	512,701.40	554,209.40	89,526.39	86,686.94		\$84.80	.803	.712
Danziger.....		351,700.14		318,042.20				33,657.94	1.059	.720
Finnish.....	4,425.00	12,629.78	5,259.00	12,693.40	834.00	63.62			.841	.720
French.....	424,709.85	535,219.62	545,356.00	645,374.00	120,646.15	110,154.98			.776	.720
German.....	1,094,215.57	1,116,058.87	1,254,427.60	1,274,935.60	160,212.03	158,876.73			.855	.720
Greek.....	52,774.99	52,774.99	53,979.60	53,979.60	1,204.61	1,204.61			.908	.724
Italian.....	359,759.93	397,293.79	431,066.40	465,077.20	71,306.47	67,783.41			.827	.720
Japanese.....	1,374,808.88	1,374,808.88	1,448,828.60	1,448,828.60	74,019.72	74,019.72			.940	.720
Netherlands.....	429,083.32	456,111.55	513,206.60	537,594.00	83,523.28	81,482.45			.831	.720
Norwegian.....	1,500,255.23	1,946,216.95	1,880,974.20	2,284,064.80	380,718.97	337,847.85			.764	.716
Panamanian.....	153,449.59	154,038.55	193,409.20	193,900.00	39,959.61	39,861.45			.759	.729
Peruvian.....	4,851.45	7,368.57	4,226.20	6,515.80			\$625.25	852.77	1.134	.738
Polish.....		405.36		337.80				67.56		.720
Spanish.....		1,678.00		1,678.00						
Swedish.....	402,501.43	439,371.95	459,298.80	492,417.40	56,797.37	53,045.45			.821	.719
United States.....	7,877,271.61	10,215,751.94	9,565,375.60	11,735,007.60	1,688,103.99	1,519,255.66			.819	.721
Venezuelan.....		2,090.70		1,729.60				361.10	1.200	.734
Yugoslavian.....	62,058.98	62,058.98	62,370.40	62,370.40	311.42	311.42			.983	.720
Total.....	19,053,857.61	23,307,062.93	22,469,558.40	26,368,594.70	3,415,326.04	3,096,535.94	625.25	35,004.17	.832	.720
Total increase.....					3,415,700.79	3,061,531.77				

HOURS OF OPERATION

Dispatching of ships through the Canal is conducted on schedules. Vessels awaiting transit begin moving through the Canal from each end at 6 a. m. and dispatches are made thereafter from each end at intervals of about half an hour. The following is a summary of the arrangements in effect at the end of the fiscal year:

From Cristobal harbor, first ship at 6 a. m., last at about 3:30 p. m.; from Balboa anchorage, first ship at 6 a. m., last at 2:30 p. m. This applies to vessels averaging 10 to 12 knots. In case a vessel is capable of 15 knots, departure may be made up to about 3 p. m. from Balboa and 3:35 p. m. from Cristobal.

Tankers with inflammable cargoes are dispatched at the discretion of the captain of the port and are not permitted to proceed unless they can clear Gaillard Cut before dark. Overloaded tankers carrying gasoline cargo are usually restricted to the early morning schedules, leaving at 6, 6:30 and 7 a. m., but may be dispatched on other schedules if traffic warrants.

The volume of traffic at present is not such as to make advisable continuous operations throughout the 24 hours of the day, or even extensive night operation. Operations throughout the night would not only involve greater expense and increase the difficulties of maintenance of locks and channel, but involve hazards of navigation in restricted channels under conditions of darkness, made worse by rains and fogs. Fogs over the Cut and lake usually fall before midnight and are dissipated by 8 o'clock in the morning.

LOCKAGES AND LOCK MAINTENANCE

Lockages and vessels handled, by months, during the past fiscal year, are shown in the following table, to which is appended for comparison a statement of the totals for the preceding 5 fiscal years:

Month	Gatun		Pedro Miguel		Mirafleres		Total	
	Lockages	Vessels	Lockages	Vessels	Lockages	Vessels	Lockages	Vessels
1934								
July.....	416	543	429	527	429	533	1,274	1,603
August.....	428	558	440	554	436	546	1,304	1,658
September.....	438	558	450	515	449	545	1,337	1,648
October.....	527	721	541	737	543	724	1,611	2,182
November.....	466	587	484	588	483	593	1,433	1,768
December.....	457	556	465	543	462	537	1,384	1,666
1935								
January.....	430	576	443	577	443	580	1,316	1,733
February.....	426	544	449	553	445	553	1,320	1,650
March.....	458	581	475	566	473	571	1,406	1,718
April.....	436	581	450	558	452	563	1,338	1,702
May.....	434	535	447	557	447	553	1,328	1,645
June.....	400	523	417	554	419	539	1,236	1,616
Total.....	5,316	6,893	5,490	6,859	5,481	6,837	16,287	20,589
Fiscal year:								
1930.....	6,135	7,164	6,436	7,430	6,338	7,431	18,909	22,025
1931.....	5,571	6,477	5,824	6,667	5,783	6,651	17,178	19,795
1932.....	4,615	5,349	4,842	5,576	4,826	5,575	14,283	16,500
1933.....	4,380	5,334	4,557	5,536	4,505	5,586	13,442	16,456
1934.....	5,365	6,593	5,507	6,745	5,483	6,705	16,355	20,043

In the fiscal year 1935 the average numbers of lockages per day were as follows: Gatun, 14.6; Pedro Miguel, 15; Miraflores, 15. In the fiscal year 1934, average numbers of lockages per day were as follows: Gatun, 14.7; Pedro Miguel, 15.1; Miraflores, 15.

The average number of vessels locked per lockage in the fiscal year was as follows: Gatun, 1.297; Pedro Miguel, 1.249; Miraflores, 1.247. The average for the total of 16,287 lockages was 1.264 vessels.

ATLANTIC LOCKS

The operating shifts remained the same during the year except temporary changes made on account of the transit of the United States Fleet and during the overhaul. During the transit of the fleet 24-hour double chamber operation was required. Arrangements were made to make follow-up lockages in the east chamber throughout the period, and to do this two towing locomotives were transferred from the Pacific to the Atlantic locks.

Due to overhaul, 24-hour operation consisting of 5 operating crews went into effect at 3 p. m. January 4, with operating crews assigned for follow-up lockages in the east chamber for 8- and 6-locomotive lockages from 7 a. m. to 11 p. m., and for 8-locomotive lockages from 11 p. m. to 7 a. m. Normal operation was resumed at 7 a. m. on April 1, with the 3 normal shifts—7 a. m. to 3 p. m., 10 a. m. to 6 p. m., and 3 p. m. to 11 p. m., each manned for 8-locomotive operation. During the change-over from west to east chamber, both chambers were in service from 8:45 p. m. February 15 to 10:30 a. m. February 20.

On account of heavy traffic, it was necessary to use part of the maintenance force as operating crews 26 times during the year. Exclusive of the extra hours worked during the passage of the fleet, the operating crews were called upon for overtime work 30 times during the year. This overtime ranged from 8 minutes to 1½ hours, totaling 15 hours and 20 minutes for the year.

Seventeen north-bound commercial ships were delayed a total of 2 hours, 26 minutes, ranging from 3 to 15 minutes; and 27 south-bound commercial vessels were delayed a total of 3½ hours, ranging from 2 to 20 minutes. No serious break-downs occurred during the year.

PACIFIC LOCKS

Operation continued on the same basis as the preceding year, except during the transit of the United States Fleet when 24-hour, double-chamber operation was required.

At Pedro Miguel one north-bound commercial vessel was delayed 12 minutes, and 8 south-bound commercial vessels, a total of 1 hour and 4 minutes, ranging from 2 to 12 minutes. At Miraflores 19

commercial vessels were delayed a total of 2 hours and 42 minutes, ranging from 2 to 18 minutes; and 6 south-bound commercial vessels, a total of 1 hour and 6 minutes, ranging from 3 to 30 minutes.

Monthly test operations were made of all emergency dams during the year, and routine maintenance and repairs were performed on all machinery and equipment.

ATLANTIC LOCKS OVERHAUL

The quadrennial overhaul of the Atlantic locks started at 3 p. m. on January 4, when the west chamber was put out of service, and was completed so that both chambers were in operation at 3 p. m. on March 30. The total elapsed time was 85 days and the actual working time 73 days. The west chamber was out of service for 47 days, the east chamber 33½ days, and 4½ days were required in the change-over from one side to the other. The extra force totaled 219 gold employees, while the extra silver force varied according to the need, with 1,035 as the maximum number over the regular force.

Six guard valves and 52 of the 56 rising-stem valves were removed and replaced by 30 spare valves and 28 of the old valves reconditioned. In general, the valves were found in very good condition. None of the cylindrical valves was removed or replaced, but after inspection 12 of the valve stems were taken out for repairs and then replaced. The principal work on them consisted in replacement of rubber seals and corroded bolts and nuts.

The principal work on the miter gates consisted in the removal of the 4 lower operating gates, and the 4 guard gates in the upper lock at the control house for replacement of all bearing plates, pintle, pintle bushing, and installation of lubricating system for the latter, replacement of yoke bushing and pins, and the replacement of miter and bearing plates only on the 8 upper operating and guard gates. In addition to the usual routine work on the gates, the drainage systems of 24 leaves were modified to permit leakage into the watertight compartments to flow into the inspection compartment where it can be removed by portable pumps.

The usual painting of gates, valves, and other parts was done. The condition of the old enamel as a whole was considered good and had afforded protection as well as expected.

Three engineers, working under the supervision of the office engineer, were detailed for duty at the locks during the entire overhaul period to render engineering and inspection services.

POWER FOR CANAL OPERATION

The power system was operated throughout the year with a combined generator output of 69,192,508 kilowatt-hours, as compared with

a combined generator output of 68,994,100 kilowatt-hours for the last fiscal year. A total of 62,921,157 kilowatt-hours was distributed to consumers as compared with 62,986,352 kilowatt-hours for the previous year. Transmission and distribution loss amounted to 6,271,351 kilowatt-hours, or 9.06 percent during the year, compared with a loss of 6,007,748 kilowatt-hours, or 8.71 percent, during the previous year.

The Gatun hydroelectric station operated throughout the year, carrying the full load of the power system except at times of peak loads and during March when tests were being conducted on the generators at Madden hydroelectric station. The Miraflores Diesel-electric station was maintained on a stand-by and peak-load service during the year and was not required to be operated for the purpose of conserving water in Gatun Lake. There were no interruptions to service at either station during the year.

The Madden hydroelectric station was placed in operation during March and was continued in operation during that month, during which period a net total of 2,670,482 kilowatt-hours was generated. This period of generation was mostly for the purpose of conducting tests, and the station has not since been operated because of the lowering of Madden Lake.

Interruptions to transmission-line service during the year totaled 14, as compared with 8 for the previous year. Seven of these failures were caused by lightning, 1 by a snake climbing the tower, 1 by a crane coming in contact with the lines, 2 by blasting operations, 2 by operating errors, and 1 undetermined. Approximately 8 miles of the line, between Cristobal and Mindi and between Mariflores and Balboa, was equipped with an additional ground wire over the middle wire of each of the two transmission lines to reduce interruptions by lightning.

Work was started in connection with the installation of two 5,333-kilowatt-ampere transformers at Balboa substation, which work includes replacement of switch gear connected therewith and rearrangement of switch gear for the synchronous condenser in that station. These transformers replaced transformers at this station which had become obsolete and of insufficient capacity for our present requirements. Modern metal-clad switch gear was installed at the Summit substation, which apparatus replaced obsolete switch gear there and provided facilities for two new feeders for serving the new naval radio station at Summit.

In all power plants and substations routine inspection and testing of various installations were continued throughout the year.

WATER SUPPLY

The inflow of water into Gatun Lake from all sources and the utilization and losses of the water in the lake are summarized in the following table. There are also shown the percentages which each item formed of the total yield or total consumption. The data are presented for the fiscal years 1934 and 1935, the former for comparison. Each year covers 12 months ending June 30, and thus embraces the cycle of both a dry and a rainy season.

	Billion cubic feet fiscal year—		Percent of total fiscal year—	
	1934	1935	1934	1935
Run-off above Madden Dam.....	72.80	76.98	37.3	34.4
Yield from land area below Madden Dam.....	80.46	102.29	41.2	45.8
Direct rainfall on the lake surface.....	42.02	44.05	21.5	19.8
Total yield.....	195.28	223.32	100.0	100.0
Evaporation from lake surface.....	21.68	21.09	11.1	9.4
Gatun Lake lockages.....	37.81	39.85	19.4	17.9
Hydroelectric power.....	49.67	51.38	25.4	23.0
Spillway waste.....	75.03	106.80	38.4	47.8
Leakage and municipal.....	1.41	1.52	.7	.7
Total uses and losses.....	185.60	220.64	95.0	98.8
Increase in storage.....	9.68	2.63	5.0	1.2
Total.....	195.28	223.32	100.0	100.0

Operation of the Gatun spillway during the fiscal year 1935 totaled 2,624 gate-hours, and of the Miraflores spillway, 427 gate-hours. Lock culvert operations at Pedro Miguel totaled 10 hours.

DRY SEASON—1935

From a water supply standpoint the 1936 dry season began January 8 and ended April 30, the total duration being 113 days. This is 9 days shorter than the dry season of 1934, and 18 days shorter than the average dry season which begins about December 29 and ends about May 8. The net yield (total yield minus evaporation) of the Gatun Lake watershed was 1,120 cubic feet a second, or 32 percent above the 22-year average of 846 cubic feet a second. The total yield was 2,006 cubic feet a second of which 55 percent was furnished by the inflow from the Madden Lake drainage area. The loss from evaporation amounted to 44 percent of the total yield. The lowest elevation of Gatun Lake was 84.62 feet on April 30. Had there been no storage available in Madden Lake the Gatun Lake elevation would have receded to 82.99 feet.

Water saving was not necessary during the dry season on account of the draw-down of 19,796 million cubic feet from Madden Lake. This

amount of rainy season storage, equivalent to 4.34 feet on Gatun Lake, was emptied into Gatun Lake during February and March. This large amount of water could not be entirely absorbed by storage in Gatun Lake and spilling at Gatun was necessary. Total spilling at Gatun and by lock culverts at Pedro Miguel for water purification purposes during the dry season, amounted to 2.71 feet on Gatun Lake. The difference in spillage, 1.63 feet on Gatun Lake, was used for dry season Canal requirements.

FLOOD WARNINGS

Responsibility for the control of Madden Lake was assumed by the section of surveys on September 1, 1934. The filling of the reservoir was begun on September 7 on a schedule providing for an increase in reservoir elevation of 5 feet per week, with an allowable deviation of 2 feet above or below, which was maintained until the latter part of November, when dry weather made it impossible to adhere to the schedule. Heavy rains in the middle of December filled the lake to elevation 236 feet on December 19. The lake was then regulated close to elevation 235 feet until January 15, when further filling was begun. Elevation 240 feet was reached on January 31, when the drum gate were started and continued in operation until March 1.

Further emptying of Madden Lake through sluice gates and needle valves was begun on March 13, and by March 28 the lake was completely drained. There was no storage of water in the reservoir between that date and the close of the fiscal year because of the necessity of making repairs to sluiceways and penstocks. Protection of this work from floods has necessitated an extensive flood warning service. An observer was moved from Peluca to Salamanca station on May 5 to give a better check on the discharge of the Pequeni River. Observers are also stationed at Candelaria and Chico stations, as the long-range automatic recorders have not proved reliable.

MADDEN DAM PROJECT

Construction of the Madden Dam project was completed during the year except for minor and special features, of which the more important are grouting of contraction joints in the main dam and ridge tightening by injection of clay grout. The contract work on the Madden Dam, power station, saddle dams, and highways over and contiguous to the dam, which began on October 13, 1931, was accepted as completed on February 9, 1935, 5 months and 16 days before the expiration of the time fixed by the contract, including extensions allowed. By the close of the year, the contractor had removed all his equipment and buildings from the Madden Dam area.

Madden Dam division personnel engaged on construction and field work were transferred to regular operation and maintenance divisions

of the Canal effective April 1. The administration, office, and drafting forces working on records, tests, and plans for new work remained on the Madden Dam rolls until June 30. On this date the Madden Dam division was abolished and all employees transferred to other divisions. The remaining work on the project will be done by the regular divisions of the organization.

FORCE EMPLOYED

The average monthly working force on the Madden Dam project is tabulated below:

	Gold	Silver	Total
United States Government.....	51	142	193
Contractors for dam.....	1 48	1 152	1 200
Total.....	99	294	393

¹ For first 8 months of fiscal year only.

Mr. John L. Savage, chief designing engineer of the United States Bureau of Reclamation, visited the Madden Dam project during October 1934 in the capacity of consulting engineer.

MADDEN DAM AND POWER PLANT

At the beginning of the fiscal year 1935 all of the mass concrete in the dam had been placed. Unfinished work included the upper portion of the power station walls and roof, completed in October; the spillway bridge, completed in September; road and parapets over the dam, completed in October; portions of the roads on left ridge dam and to the north of the dam, completed in October, part of the penstock trash rack structure; and the spillway crests; completed in July 1934.

RIVER CONTROL AND MADDEN LAKE

The sluiceways and needle valve outlets were used to regulate the river until the lake reached spillway level. On September 7 a gradual-controlled raising of the lake was begun and on December 18 the first water was allowed to flow over the crest of the spillway. Water was held at or near spillway crest level until January 17 when it was gradually raised, reaching elevation plus 240 on January 31 and a maximum of 240.36 on February 3. On February 12 the lake was lowered, held at spillway crest until March 13, when it was gradually emptied, reaching bottom on March 28.

Observations were made during the raising of the water level, in and about the dam, on the wetted side of the narrowest portions of the right bank, and on the dry sides of both the right and left banks.

While the lake was being lowered, acceptance tests were made on the turbines in the power station.

CAVITATION IN SLUICeways

After the lake was drained, an inspection of all sluiceways revealed cavitation in those which had been operated for considerable periods under high heads of water. The cuttings reached a maximum depth of 19 to 20 inches and exposed and loosened the reinforcing bars above the sluiceways. Sluiceways 5 and 6 were repaired by adding bell-mouth entrances to their upstream end. Repairs to the other sluiceways were incomplete at the close of the fiscal year.

MECHANICAL AND ELECTRICAL WORK

At the close of the fiscal year there were in place some 705,000 pounds of trash rack metal work. During the year an additional amount of 492,000 pounds was installed, and this work is now complete.

By the end of the fiscal year 1934 the placing of the 3 penstocks and 2 outlet pipes was completed and the bituminous protective coating applied to their interior surfaces. There still remained numerous leaks at joints and around rivets through which water entered from the outside to cause blistering and peeling, and these were repaired by welding, calking, and grouting operations.

The five 132-inch butterfly valves were completed by installing electrical circuits and painting; to prevent damage, which might result from the overtravel of their gear segments, bumping posts were designed and installed. The two 84-inch needle valves were completed and put into operation; a newly designed breather manifold was made and installed. The four 100- by 18-foot spillway drum gates were completed by assembling, adjusting, painting and welding; installing and adjusting control apparatus, and placing in operation the remote electrical controls.

The installation by Government forces of the hydraulic turbines, generators, switchboard, governors, and outdoor apparatus, including transformers, high-tension switching system, oil circuit breakers, and lightning arresters, was completed during the year. The transmission line and switching equipment had been energized by February 19. Both generators had been placed under load by March 6 and remained in practically continuous service until March 26. Tests of the hydraulic turbines were satisfactory and they were authorized for acceptance on May 9.

Installation was started in August 1934 of equipment for cooling the mass concrete of the dam through the system of pipes installed for grouting the contraction joints. After completion and testing, opera-

tion was started on April 30 but discontinued on May 3 due to the silt content in the river water resulting from emptying the reservoir.

Observations were made throughout the year on uplift pressures under dam, temperature of concrete, strain in and shrinkage of concrete. Tests were run to determine friction losses, rate of discharge, water hammer, and efficiency of air-vent piping for penstocks and outlet pipes; torque curves for butterfly valves; efficiency, capacity, and speed regulation of hydraulic turbines; pressure in needle valves; discharge, friction losses, and efficiency of air inlets for sluiceways; pressures in sluiceway during spillway flows; and measurements of leakage through sluice gates; water pressure along center line, efficiency of air inlet, pressure along crest, water surface over crest; rates of discharge, and a comparison of paints used for drum gates. Tests were also made to determine water pressure against spillway piers, and against spillway training wall, velocities and pressures against spillway apron. Measurements were made of erosion downstream from spillway apron and downstream from needle valve outlets. Tests and observations were made of differential pressures in turbine scroll cases and in outlet pipe reducing sections; also of currents in Madden Lake, and chemical analysis of Madden Lake water.

SADDLE DAMS AND ROADS

Only maintenance work was done on the saddle dams. As the grass planted on the earth slopes had rooted and formed a good protective surface against erosion from rain, a very small amount of gullies needed filling. No grass was planted on saddle Dam No. 10, but it showed no material erosion as its exposed slope was small. On saddle Dam No. 11 gravel was placed on the water side earth slope, completing it to the top.

All concrete highways contiguous to the dam were completed and from them narrow wagon roads, roughly graded and surfaced with a run-of-bank gravel layer 12 inches thick, were extended along both the right and left banks of the river. The road on the right bank gives access to two saddle dams and the clay grouting work and is 4,906 feet in length. The one on the left bank gives access to 11 saddle dams and is 11,344 feet in length.

RIDGE TIGHTENING

Ridge tightening by injection of clay grout was continued throughout the year and was incomplete at the close of the fiscal year. The future program will be more fully determine after further study by geologists. During the past year operations were confined to area no. 2 and sink hole no. 20, near it. A shaft was sunk to give access to sink hole no. 20 cavern and inspections revealed that the grout formerly forced into the branches from the cavern had, to some

extent, leaked into the cavern. After repairing the barriers between the cavern and the branches the work was finally completed in May. The estimated total grout placed in sink hole no. 20 this year is 3,327.4 cubic yards, and to date, including prior years, is 7,363.4 cubic yards.

The grouting program for area no. 2 was gradually extended by adding holes toward the south. The procedure did not change from the previous year, the gravel road expediting the work and lessening the cost of transportation. The total grout injected during the fiscal year in area no. 2 is estimated to be 7,983 cubic yards, and for prior fiscal years 13,473 cubic yards, giving a total to date of 21,456 cubic yards.

EARNINGS, DEDUCTIONS, AND PAYMENTS

The thirty-seventh and final payment to the contractors for Madden Dam, amounting to \$145,287.82, was made on March 16, 1935. The total contract payments amounted to \$4,492,379.24. The contractors took exceptions to the amount paid and made additional claims under 47 items to an aggregate amount of \$469,456.04.

MAINTENANCE OF CHANNEL AND IMPROVEMENT PROJECTS

In addition to the maintenance of the Canal channel, dredging activities during the year included auxiliary dredging at Coco Solo, Cristobal drydock slip, and around the steamship *Wisconsin*, grounded in Gatun Lake; also at Chamé and in the Chagres River in connection with sand and gravel operations.

Excavation during the fiscal year is summarized in the following table:

Location—Canal prism dredging	Maintenance		
	Earth	Rock	Total
Atlantic entrance:	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>
Maintenance.....	1,555,000		1,555,000
Project no. 11.....	29,200	26,000	55,200
Gatun Lake:			
Maintenance.....	670,250	29,000	699,250
Project no. 3.....	571,400	88,000	659,400
Gaillard Cut:			
Maintenance (including slides).....	156,450	313,800	470,250
Project no. 3.....	52,950	206,900	259,850
Project no. 5.....	46,500	160,700	207,200
Project no. 9.....		11,150	11,150
Project no. 13.....	650	4,050	4,700
Pacific entrance (maintenance).....	72,500		72,500
Total, Canal prism.....	3,154,900	839,600	3,994,500
Cristobal inner harbor (maintenance).....	1,205,000	126,100	1,331,100
Cristobal Drydock slip.....	24,600	35,620	60,220
Fleet air base, Coco Solo.....	10,600	210,500	221,100
Grounded steamship <i>Wisconsin</i> (Gatun Lake).....	15,200	15,300	30,500
Chagres River gravel service.....	534,600		534,600
Total.....	1,790,000	387,520	2,177,520
Grand total.....	4,944,900	1,227,120	6,172,020

¹ In addition, 7,000 cubic yards of Chamé sand were produced by the crane boat *Atlas*.

² In addition, 220,800 cubic yards of rehandled material was excavated; 37,500 cubic yards from the Atlantic entrance on project no. 11, and 183,300 cubic yards from Gatun Lake maintenance.

Dredging operations in the Canal are divided into three major districts: The northern district, from contour 42 feet below mean sea level in the Atlantic Ocean to Gamboa; the central district, Gaillard Cut, from Gamboa to Pedro Miguel Locks; the southern district, from Pedro Miguel Locks to contour 50 feet below mean sea level in the Pacific Ocean. Excavation in these three districts is summarized as follows:

	Canal prism			Auxiliary			Total		
	Earth	Rock	Total	Earth	Rock	Total	Earth	Rock	Total
	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>
Northern....	3,963,550	336,400	4,299,950	50,400	261,420	311,820	4,013,950	597,820 ¹	4,611,770
Central....	256,550	696,600	953,150	-----	-----	-----	256,550	696,600	² 953,150
Southern....	72,500	-----	72,500	-----	-----	-----	72,500	-----	³ 72,500
Total....	4,292,600	1,033,000	5,325,600	50,400	261,420	311,820	4,343,000	1,294,420	5,637,420

¹ Does not include 220,800 cubic yards of rehandled material.

² Does not include 534,600 cubic yards of Chagres River gravel production of which 201,000 cubic yards was run-of-bank gravel in stock pile and 333,600 cubic yards of uncover excavation.

³ Does not include 7,000 cubic yards of Chamé sand produced.

CANAL IMPROVEMENT WORKS

Project no. 1.—This project, consisting of deepening the Pacific entrance channel from Miraflores Locks to the sea buoys, including the Balboa inner harbor from —45 feet to a ruling depth of —50 feet (mean sea level datum) was begun in 1924. Projects 1-A and 1-B, Pacific entrance, and project 1-A, Balboa Harbor, were subsequently authorized as outlined in the annual report for the fiscal year 1931.

There was no dredging on project no. 1, Pacific entrance, or Balboa Harbor, during the year.

At the end of the year excavation on the Pacific entrance portion of this project was 83.2 percent completed and on the harbor portion 90 percent completed.

Project no. 3.—This project consists of widening the channel at the north entrance of Gaillard Cut and extending northward, terminating at the south end of Gamboa Reach. Work on this project was started during September 1929. During the year a total of 919,250 cubic yards was excavated in the Gaillard Cut and Gatun Lake sections of this project, and at the close of the year excavation was 93 percent completed.

Project no. 5 (revised).—This project, which involves widening the Gaillard Cut approach to Pedro Miguel Locks, was started in December 1930. Excavation during the year amounted to 207,200 cubic yards, the work on the project being 86.8 percent completed at the end of the fiscal year.

Project no. 6.—This project, consisting of widening Miraflores Lake channel, was begun in April 1932. There was no work performed

during the year, and at the end of the year excavation on this project was 73 percent completed.

Project no. 9.—This project, which consists of widening the channel fronting the West Culebra slide, was started during June 1928. During the fiscal year a total of 11,150 cubic yards was excavated on this project, completing same in December 1934.

Project no. 11.—This project, which consists of removing a number of shoals in Limon Bay, was started in September 1934. During the year a total of 55,200 cubic yards was removed, and excavation was 8.3 percent completed at the close of the fiscal year.

Project no. 13.—This is a new project, authorized in October 1934. It consists of widening the entire Culebra Reach of Gaillard Cut by 200 feet; that is, from a minimum of 300 feet to a minimum of 500 feet bottom width, with suitable easements into the Cucaracha Reach on the south and the Empire Reach on the north. The principal objects sought by the proposed improvement are: (a) Virtual elimination of the danger of complete channel closure in the section most susceptible to slides; (b) improved alinement and maneuverability at the intersection of the Cucaracha and Culebra Reaches; (c) to provide a section in the Cut suitable for use in passing large vessels now accorded a "clear cut" or one-way traffic interval, as well as to facilitate passing normal traffic under conditions of night operation. Although this is an independent project, it will fit into any subsequent project involving the widening of the entire Gaillard Cut if that should be found necessary in the future. Work on this project was inaugurated in January but was carried forward only intermittently during the remainder of the fiscal year, the work done consisting principally of drilling and blasting large boulders lying on the west bank within the project limits, together with a limited amount of subaqueous drilling and blasting through drill boat operations. A total of 4,700 cubic yards was excavated on this project and excavation was 0.1 percent completed at the close of the fiscal year.

MAINTENANCE

Gaillard Cut.—Three dipper dredges worked 12½ days, 11½ days, and 15½ days, respectively, on general clean-up work in Gaillard Cut during the year, excavating a total of 105,900 cubic yards of earth and rock from this area. The material removed by the dipper dredges was loaded in barges and dumped north of Gamboa.

Atlantic entrance, Cristobal Harbor, and Gatun Lake.—Excavation in the Atlantic entrance and Cristobal Harbor areas by pipe-line suction and dipper dredges amounted to a total of 2,886,100 cubic yards. This material was dumped as follows: 1,264,000 cubic yards on the north side of the east breakwater, 291,000 cubic yards on Washington

Shoal, 1,138,600 cubic yards on Telfers Island, and 192,500 cubic yards at sea. In the Gatun Lake sector of the Canal channel a total of 1,228,800 cubic yards of material was removed by pipe-line-suction dredge, consisting of rock, clay, silt, and gravel, all of which was pumped to the proposed Gamboa industrial area and town-site fills. Also, 283,550 cubic yards of earth and rock were excavated from Gatun Lake by dipper dredges. With the exception of 183,300 cubic yards overcast on the Gamboa industrial area, all of this material was loaded in scows and dumped north of Gamboa.

Pacific entrance, Balboa Harbor, and Miraflores Lake.—A total of 72,500 cubic yards of silt was removed from the Pacific entrance channel by the crane boat *Atlas* equipped with outboard suction drag which was deposited in a barge and dumped at sea. No dredging was performed in Balboa Harbor or Miraflores Lake during the year.

SLIDES

Culebra slide extension (east) and west Lirio slides were the only two areas that produced movements threatening the channel and in both cases immediate dredging operations prevented any appreciable encroachment on the channel.

Culebra slide (west) was in slow continuous movement throughout the year. Early in December a large mass of solid basaltic rock, estimated at between 150,000 and 200,000 cubic yards, broke away from the face of Zion Hill but moved only a very short distance.

The following excavation in slide areas was performed during the year:

Lirio slide (east).—A dipper dredge worked in this slide 2 days, removing a total of 11,800 cubic yards.

Lirio slide (west).—A dipper dredge worked in this slide 13½ days, removing a total of 82,250 cubic yards.

Barge repair slide (east).—A dipper dredge worked in this slide 1½ days, removing a total of 9,950 cubic yards.

Culebra slide extension (east).—A dipper dredge worked in this slide 6½ days, removing a total of 35,950 cubic yards.

Culebra slide (west).—Two dipper dredges worked in this slide respectively for 9 and 28½ days, removing a total of 149,800 cubic yards.

Culebra slide (east).—Two dipper dredges worked in this slide respectively for 7 and 6½ days, removing a total of 74,600 cubic yards.

The total slide excavation for the fiscal year amounted to 364,350 cubic yards.

There were numerous small breaks at various points in Gaillard Cut during the year, but there was no interference with shipping on account of slides during the period.

Slide prevention by correction of improper drainage conditions was continued throughout the year with ditching operations in Lirio Lagoon. Routine inspection was made of all slide areas throughout the year with a daily drag of the Canal channel fronting all active slides. Monthly observation of reference points in all principal slide areas was maintained.

AUXILIARY DREDGING

Fill for fleet air base, Coco Solo.—The dipper dredge *Cascadas* broke up and overcast 141,000 cubic yards of coral rock in the Coco Solo borrow pit. The *Las Cruces* excavated 80,100 cubic yards of this material and pumped it to the Coco Solo fleet air base hydraulic fill.

Cristobal Drydock slip.—The dipper dredge *Cascadas* and the crane boat *Atlas* excavated 60,200 cubic yards of earth and rock from the Cristobal Drydock slip. All of this material was loaded into scows and dumped at sea.

SUBSIDIARY DREDGING DIVISION ACTIVITIES

At the Chagres River gravel plant at Gamboa 43,926 cubic yards of sand and gravel were on hand at the beginning of the year. During the year 39,760 cubic yards were shipped and 201,000 cubic yards were reclaimed by dredging. There was an inventory adjustment of 4,420 cubic yards of large stone waste, leaving 200,746 cubic yards of run-of-bank gravel on hand at the close of the year. The gravel plant was relocated during the year and the new plant was placed in operation June 25, 1935.

The work of removing floating obstructions and water hyacinths in Gaillard Cut, Miraflores and Gatun Lakes was continued throughout the year. The number of hyacinth plants destroyed during the year by pulling or spraying was estimated at 35,826,750. The use of arsenic and soda for spraying in Gatun Lake was discontinued in the month of March, and in all Canal water in June. Experiments were under way with other solutions at the close of the year.

Log booms were maintained at the mouths of the Chagres and Mandingo Rivers to prevent hyacinths, trees, and other floating obstructions from drifting into the Canal during freshets. Driftwood, amounting to approximately 1,500 cords, was burned along the river bank during the dry season.

The crane boat *Atlas* pumped 7,000 cubic yards of sand into barges at Chamé and delivered it alongside the Balboa coaling station unloading dock for use of the supply department. The 250-ton floating crane *Hercules*, equipped with heavy steam hammer, drove the concrete piles for new Army mine dock at Naos Island. During February the dipper dredge *Gamboa* excavated 30,500 cubic yards of material from around the steamship *Wisconsin*, aground in Gatun Lake, and then assisted in pulling the ship into deep water.

EQUIPMENT

During the year a new 1,000-yard sump scow and a new hydraulic grader were delivered to the dredging division by the mechanical division, the latter replacing grader *No. 3*. Other additions included a derrick barge and a silt barge, the former being transferred from the Panama Railroad Co. and the latter being a converted sand barge for use in connection with dredging activities of the crane boat *Atlas*. The crane boat *Atlas* was equipped with gear for operating as a dredge of the seagoing suction dredge type. The launch *Gar* was received from the United States and put in service.

The following floating equipment was employed during the fiscal year: Three 15-yard dipper dredges, *Cascadas*, *Gamboa*, and *Paraiso*, operated 2.8 months, 6.1 months, and 3.1 months, respectively. The 24-inch pipe line suction dredge *Las Cruces* was in service 11.4 months during the year. The crane boat *Atlas* was operated as a dredge for 1 month and made 7 trips to Chamé for sand and was used for the remainder of the fiscal year in transportation, towing, rigging, and miscellaneous services. Hydraulic grader *No. 3* was operated for 3 months. Drill boat *Terrier No. 2* was operated 10 months and the drillboat *Teredo No. 2* was operated 2 months during the year. Air compressor *No. 29* was operated 10.3 months. Derrick barge *No. 157* was operated 0.5 month. Excavator *No. 1* was operated 6.7 months, and excavator *No. 2*, 5.5 months. The 250-ton cranes *Ajax* and *Hercules* were operated on alternate months excepting when calls for extra service required the commissioning of both cranes. Three large tugs were operated during the year as well as nine launches. The Diesel ferryboats *President Roosevelt* and *Presidente Amador* were engaged in operation of the ferry service at Balboa during the year.

GAMBOA DREDGING STATION AND TOWNSITE

A new dredging station and townsite is being developed at Gamboa located at the junction of the Chagres River and the Canal, in connection with proposed transfer of dredging division headquarters from Paraiso to Gamboa.

The entire project involves the installation of new water-front facilities to replace those at Paraiso, including shop buildings, store-houses, repair dock and small boat landings. Quarters and community buildings are required, together with water and power lines, sewerage system and roadways. The existing water-front facilities, repair shops and other buildings at Paraiso are in urgent need of replacement and the new dredging station will be located at the most advantageous point available, both from the standpoint of maintenance of the Canal and the security of moored equipment, as the new station is between any possible point of closure of Gaillard Cut,

from slides, and spoil dumps in Gatun Lake; and in addition, equipment moored or under repairs will be protected from damage by transiting vessels in contrast with the existing exposed conditions at Paraiso. Similarly, practically the entire town of Paraiso is in need of rebuilding, as all of the buildings are over twenty years old and many of them were erected during the French construction period.

The removal of the dredging station to Gamboa will permit the eventual abandonment of Paraiso as a town and evacuation of quarters in Pedro Miguel, Ancon, Balboa, Red Tank, and La Boca now occupied by dredging division employees will provide additional facilities needed for locks employees and others.

The new town is intended primarily for the forces of the dredging division, both gold and silver, but will also furnish homes for employees of the lighthouse division and such incidental employees as are necessary, such as doctors, police, and firemen. Gold quarters will be built on the hills lying to the east of the present Panama Railroad station, and silver quarters will be built on the flat land to the north. The dredging division shops and offices will be built on the bank of the Canal, opposite the silver townsite.

The period of construction has been set at 3 years, at the end of which time it is hoped that quarters will have been provided for about 180 Americans and 630 native workers and their families.

Grading was started on March 1, 1935, and shortly thereafter street paving, sewer work, and water lines were begun. Spoil dredged from the Canal was used for filling and grading portions of the townsite area.

FERRY SERVICE

Ferry service across the Pacific entrance of the Canal, connecting La Boca, Balboa, and Panama City on the east bank of the Canal with Thatcher Highway on the west bank, was operated by the dredging division throughout the year. The ferries made a total of 11,310 round trips during the year, carrying 5,947 Panama Canal, 10,038 United States Army, and 187,235 other vehicles. Passengers carried totaled 1,052,663, as compared with 926,617 during the preceding year.

AIDS TO NAVIGATION

A number of improvements and adjustments were made in the lights, buoys, beacons, etc., maintained as navigational aids for vessels operating in the Canal and adjacent waters. A gas buoy, painted with black and red horizontal stripes, was established in 28 feet of water 500 yards southwest of the Coco Solo mole, marking a 23-foot shoal. Gas buoy no. 95, flashing white, was established in 42 feet of water near station 1440, east, at Gamboa. Three gas

buoys, flashing white, were established in Gaillard Cut to mark the east prism line of the Canal. Gas buoy no. 94 was established on the east prism line of the Canal near station 1482, east, and gas buoy no. 96 was established at station 1493, west, both flashing red. A gas buoy marked Gamboa, flashing red, was established in 40 feet of water on the site formerly occupied by beacon no. 30, at Gamboa, and the beacon discontinued. For the benefit of aircraft using the Folks River area of Manzanillo Bay, an occulting green light was established on the southern shore of Folks River directly northeast from Silver City, in the Atlantic sector. Throughout the year the lighthouse subdivision continued the care and upkeep of 133 gas, 253 electric, and 272 unlighted aids to navigation in the Canal and adjacent waters.

At Isla Grande Lighthouse two new Diesel-engine-driven generating sets were installed during the latter part of November 1934, displacing the obsolete kerosene-engine sets formerly used. At the request of the Commissioner of Lighthouses, United States Department of Commerce, the characteristic of the Jicarita Island Lighthouse was changed June 9, 1935, to flashing white 1.5 seconds' duration every 15 seconds, with short intermediate flashes every 2 seconds. The lighthouse tender U. S. S. *Favorite* made four visits to this light and to the light at Morro Puercos during the year.

In connection with the study of fog conditions in the Canal now being conducted under a systemized plan supervised by the fog committee, there are in process of construction a series of 14 experimental fog lights. Installation is on the east bank of the Canal from station 1675 to station 1710 in Gaillard Cut. These lights are spaced 250 feet apart on a special power line to be independently operated by a switch in the signal station.

ACCIDENTS TO SHIPPING

The board of local inspectors conducted investigations and submitted reports on 28 accidents of a marine nature occurring to vessels either in transit or in the terminal ports of the Canal, as compared with 34 last year and 26 the year before. Classification of the 28 accidents shows the following: Struck docks, 5; struck Canal bank, 4; line fouled propeller, 4; struck lock wall, 3; anchor damaged submerged cables, 2; damaged by wash of passing vessel, 2; grounded, 2; sunk, 1; fouled by another vessel, 1; hose burst while fueling, 1; struck submerged object, 1; broke bitt, 1; explosion and fire, 1.

In August 1934, the Japanese steamer *Venice Maru*, outward bound from Balboa, discovered fire in her hold and returned to Balboa. The Panama Canal salvage tug *Favorite*, assisted by other Canal craft, extinguished the fire by midafternoon of the following day. The steamship *Harlinger* went ashore in Tavernilla Reach September 18, 1934, and was towed to Cristobal by the *Favorite*.

The *Favorite* also towed the Peruvian steamer *Maranon* to Cristobal after it had radioed for assistance from latitude 9.29 north, longitude 78.10 west, on January 4, 1935, and on January 21, 1935, picked up a disabled United States Navy seaplane and crew of five near Iguana Island, off Cape Mala. The steamship *Wisconsin* went hard aground in the Canal during a fog, about 500 feet south of the Darien radio station, on the morning of February 17, 1935. With the assistance of dredging equipment, this vessel was refloated on the morning of February 20.

METEOROLOGY—HYDROLOGY—SEISMOLOGY

Precipitation.—Rainfall for the calendar year 1934 averaged, in general, above normal. Annual totals for Canal Zone and vicinity for the calendar year 1934 ranged from 74.44 inches at Panama airport (Paitilla Point), Republic of Panama, to 157.56 inches at Porto Bello. During the year the maximum precipitation recorded in 24 consecutive hours in the Canal Zone and vicinity was 9.82 inches at Cristobal on November 16 and 17. The average precipitation in the Pacific section was 82.17 inches; in the central section, 110.14 inches; and in the Atlantic section, 145.04 inches.

Air temperatures.—The maximum and minimum temperatures of years of record at various stations, revised to June 30, 1935, and the annual average temperature for the years of record, are shown in the tabulation following:

Station	Maximum		Minimum		Annual average	Years of record
	° F.	Date	° F.	Date		
Balboa Heights.....	97	Apr. 7, 1912	63	Jan. 27, 1910	78.7	29
Alhajuela.....	98	Apr. 13, 1920	59	{Feb. 4, 1924 Jan. 30, 1929}	78.5	24
Gatun.....	95	{May 4, 1933 May 21, 1925}	66	Aug. 7, 1912	80.4	24
Cristobal.....	95	{Oct. 18, 1924 May 21, 1925}	66	Dec. 3, 1909	80.0	27

The average air temperature for the calendar year 1934 was, in general, below normal. April was the warmest month and November the coolest.

Winds and humidity.—The annual wind movement in the Canal Zone for the calendar year 1934 was below normal. March was the month of greatest average wind velocity and October the month of the lowest. The mean relative humidity of the atmosphere for the calendar year 1934 was about 84 percent on the Pacific coast and 81 percent on the Atlantic. March was the month of least average relative humidity and October the greatest.

Tides.—For the calendar year 1934 the maximum high tide at Balboa, 10.6 feet above mean sea level, occurred on August 22 and September 25; the maximum low tide, 10.6 feet below mean sea level, occurred on February 16. The greatest daily range, 20.1 feet, also occurred on February 16. At Cristobal the maximum high tide, plus 1.39 feet, occurred on December 15; the maximum low tide, -1.11 feet, occurred on June 13, and the greatest daily range, 1.96 feet, occurred on June 26.

Seismology.—Two hundred and forty-four seismic disturbances were recorded at the Balboa Heights seismological station during the calendar year 1934. One hundred and nine of these disturbances were of comparatively close origin, about 250 miles distant, 15 of which were generally felt in the Canal Zone and vicinity. Twelve were of distant origin, and 123 were so slight that no estimate could be made of their epicenter. Eighty seismic disturbances were recorded in July 1934, all of which (with the exception of a slight tremor on July 7, with its epicenter at 60 miles distant) composed a series of earthquakes from a southwesterly direction at an approximate distance of about 200 to 250 miles from our station. They were felt throughout the Republic of Panama and the Canal Zone. Of these quakes, only two were strong enough to trip into action the motor of the new strong-motion accelerometer, which had just been installed. Considerable damage occurred at David and Puerto Armuelles, Republic of Panama. The disturbance at 10:40:04 Greenwich mean time on July 21 (not recorded by strong-motion accelerometer) felled about 15 of the United Fruit Co.'s quarters at Puerto Armuelles, destroyed the outer end of the Panamanian Government's wharf, and badly damaged the remainder. The quake also felled a large water tank at that place. No damage occurred to any Canal structure. Seventy-six seismic disturbances were recorded during the first 6 months of 1935. Of these, three were felt generally in El Volcan region and city of David, Republic of Panama.

Fog conditions.—The committee on fogs, composed of the assistant engineer of maintenance, the superintendent of dredging, and the port captain, Balboa, continued its studies of the possible interruption of Canal traffic in Gaillard Cut and elsewhere, due to the occurrence of fog. These studies look to the future when 24-hour operation of the Canal will be required and have the following purposes in view:

(a) To determine the average number of hours that Canal shipping will be delayed in transit; (b) to establish a standard of measurement by which it can be stated definitely that fog conditions are safe or unsafe for Canal navigation; (c) to devise some economical means of lighting or other plan that will permit safe navigation during periods of fog; (d) to keep the Canal abreast of advances made elsewhere.

During November and December 1933, and from September to November, inclusive, 1934, observers were stationed in the Cut and numerous observations were made, supplemented by actual navigation tests. From a combination of these reports it became fairly well established that fog conditions become dangerous to navigation when channel lights are obscured for a distance of 1,000 feet. Little has been accomplished in the way of devising a means that will permit safe navigation in heavy fog, but experimental work will be continued. It is planned to experiment with searchlights and bank light improvements during the coming year, and negotiations are under way for the purchase of photoelectric and searchlight apparatus for recording the density of fog.

TRANSIT OF UNITED STATES FLEET

The United States Fleet made the transit southbound, starting with the entrance of the first destroyer at Gatun at 12:01 a. m. October 24, and was completed with the clearing of the last auxiliary at Miraflores at 4:01 p. m. on the 25th, a total elapsed time of exactly 40 hours. The transit of the fleet required 45 lockages, and was immediately followed by 22 lockages of commercial ships south-bound and then 23 lockages north-bound and 13 south-bound. These lockages were completed by midnight of the 26th-27th and conditions were back to normal on the morning of the 27th.

The transit of the fleet was made without major incident. Two lampposts, one at Gatun and one at Pedro Miguel Locks, were knocked down and an arrow signal slightly damaged at Gatun. The maneuver again demonstrated the preparedness of the Canal to meet extraordinary peaks of demand for service of this nature with a minimum of delay and inconvenience to commercial shipping and offered an opportunity to perfect further the details of operation under such conditions.

RULES AND REGULATIONS

The rules and regulations for the navigation of the Panama Canal and adjacent waters, effective January 1, 1926, issued under Executive order of September 25, 1925, and reprinted as of August 1, 1931, were supplemented by the promulgation on March 1, 1935, of Supplement No. 6 to these regulations. Supplement No. 6 supersedes Supplement No. 4 of February 15, 1934, and prescribes regulations for the transportation of hazardous cargoes in Canal Zone waters. Under the provisions of this supplement the admeasurers at the terminal ports have been delegated to make the necessary examination of vessels transporting dangerous cargoes, with the chief admeasurer, Balboa, as coordinating officer for the transmission of report on each vessel of this type to the office of the marine superintendent. The Pilot's Handbook, issued in 1930, has been revised and was in the hands of the printer at the close of the fiscal year.

SECTION II

BUSINESS OPERATIONS

The business enterprises carried forward by the Canal and by the Panama Railroad Co. embrace a number of activities which in the United States would normally be carried on by private initiative. These activities have been developed either to meet the needs and demands of shipping passing through the Canal, or to meet the needs of the organization and its force of employees. The business enterprises include those sections of the Canal and railroad organizations which are engaged in the supplying of fuel, provisions, ship chandlery, and repairs to vessels and of food, clothing, and other essentials to Canal and railroad employees; the handling of cargo and allied operations; and the operation and management of the Panama Railroad and of the steamship line operating between New York and the Isthmus.

For accounting purposes, the Canal and the railroad organizations are separate but in administration and performance of work they are united and under the central control of the Governor of the Panama Canal.

PANAMA CANAL BUSINESS OPERATIONS

The profits, or excess of revenue over expenses, for the business activities of the Panama Canal amounted to \$1,021,216.61 for the year, as compared with \$1,366,755.12 for the fiscal year 1934, or a decrease of 25.3 percent. Of the indicated excess of revenues over expenses in 1935 the sum of \$144,851.74 is due to impoundings of percentages of salaries and wages in accordance with the economy act. During 1934 this figure was \$596,554.74. The profits were made principally in the electric light and power system, the shops and drydocks, the fuel oil plants, and storehouse operations. The results are presented in some detail in table 26 in section V.

In the accounting of profits and losses of the business activities there is no actual interest charge on the money invested in these plants and their equipment. This investment totaled \$26,776,633.32 at the beginning of the fiscal year and \$29,067,383.76 at the end (table 4, sec. V). To establish a criterion for profit, a capital charge has been calculated, based on 3 percent of the capital investment (with minor variations such as 2 percent on public works in Panama and Colon, to accord with existing contracts and 1½ percent on the shops at

Balboa, which for reasons of national defense were made somewhat more extensive than the needs of commerce require) plus relatively slight amounts representing variations in supplies on hand. This theoretical capital charge for the fiscal year 1935 was \$773,700.57 (table 20, sec. V). The profits of \$1,021,216.61 exceeded this amount by \$247,516.04.

Based on the figure of \$26,776,633.32, representing fixed property and equipment alone at the beginning of the year, the profits counted at \$1,021,216.61 showed a return of 3.81 percent.

MECHANICAL DIVISION

The mechanical division has jurisdiction over the mechanical and marine shops, drydocks, car shops and roundhouses at Balboa and Cristobal; the design, construction, and major alteration of hulls and machinery of propelled and nonpropelled floating equipment of the Panama Canal, Panama Railroad, and commercial business, except the electrical work; the design and technical matters of the railway rolling stock and of propelled and nonpropelled floating craft involving naval architectural subjects for the hulls and marine engineering subjects for the operating machinery; repairs to all equipment, floating or otherwise, of the Canal, railroad, and commercial business requiring mechanical or marine shop or drydock facilities, except electrical and automotive repair; the railway car inspection including repair of rolling stock, hostling, and manning the railway wrecking outfit; the maintaining of inspection services including tests and repairs except electrical and marine boilers for Canal and railroad for passenger and freight elevators, for weighing scales and measuring devices (scales, pumps, meters) and for clocks, typewriters, and similar instruments; manufacture and distribution of compressed air, acetylene, oxygen, and hydrogen; and the fabrication of such machinery or equipment, floating or otherwise, spare parts, etc., as in the opinion of the Governor may be more economically or expediently made on the Canal Zone than purchased elsewhere.

MARINE WORK

Marine work continued to constitute the major source of revenue for the division, providing 60.34 percent of the total work completed during the past fiscal year and 64.27, 60.55, and 64.25 percent for the 3 preceding fiscal years. As to the source of the marine work, the Panama Canal furnishes the greatest part of the work, as the time is past since work for commercial vessels and for the Navy contributed an overshadowing share of the total income.

Repairs to commercial vessels.—Repairs to commercial vessels consisted principally of urgent repairs to vessels transiting the Canal. For the first time in many years there was no large renewal of a ship's bottom either at Balboa or at Cristobal. Unless a ship's itinerary is confined to this part of the world, the Canal shops are unlikely to be called upon to make periodical overhauls or extensive repairs of vessels as the demands are largely confined to emergency or running repairs. The more important work handled for commercial shipping included the following:

In February, the steamship *Coya* was drydocked at Balboa after having been ashore on the Central American coast, and although she had suffered heavy damage over most of her bottom, temporary repairs only were authorized.

In March, extensive engine repairs were effected at Balboa on the motorship *Cellini*. The engine had to be taken apart and removed from the ship down to the bed plate to permit rebuilding of the crankshaft. One new stub end and a new crank web were forged and fitted to the shaft; the forging for the latter being so heavy that the 600-ton forging press at Balboa was barely able to cope with it. The heavy flywheel on the engine was also loose and its hub had to be reconditioned. On reinstalling the crankshaft the engine was thoroughly realined. This was the most important machinery repair job of the year at either plant, its cost amounting to about \$25,000.

The American-Hawaiian Line motorship *Missourian* was overhauled at Balboa, having burned out all the main bearings on one engine. Several forms of makeshift staying and bracing of the engine were in place to prevent the weaving of the engine on its base, due to the age of the ship and the consequent loss of the original rigidity of its support. Structural reinforcement under the engine was recommended by the mechanical division as a permanent measure, but emergency repairs only were desired by remetalling and refitting the bearings with a superior grade of babbit.

Work of lesser importance included renewing the foremast and booms of the motorship *Santa Monica* which had been crumpled by excessive roll and lurching of the ship while removing a heavy boat carried as cargo; a new tail shaft and propeller blades were installed on both the motorship *Hindanger* and the steamship *Flomar*; propeller blades were renewed on the steamships *Yosha Maru*, *Columbian*, *K. R. Kingsbury*, *Santa Cecilia*, and *Tacoma Star*; drydocking and under-water hull repairs were performed for the motorship *Stella Maris*, steamship *Perene*, and the cableship *All America*; both under-water hull repairs and propeller repairs involving drydocking were performed on the steamships *Cerigo* and *Urubamba*.

Repairs to naval vessels.—With the reopening of the Cristobal drydock, the bulk of the repair work for the Navy has shifted from Balboa to the Cristobal shops, because of the convenience of the latter to the submarine base at Coco Solo.

The volume of naval repair work declined as compared with previous years, and the outlook for fiscal year 1936 is for a further decline as five of the submarines based at Coco Solo which were in need of heavy repairs were recently sent to the United States for decommissioning. The effect of this action not only is unsettling but it will result in varying the work load at Cristobal to such a degree that it probably will necessitate a reduction in force at the Cristobal shops.

The work performed for the Navy during the year included the following: Minor repairs and docking were completed on the U. S. S. *Trenton* and the U. S. S. *Taylor* of the Special Service Squadron; the U. S. S. *Hannibal* and the survey tenders accompanying her, the *YP41* and *YP42*, were overhauled. Drydocking and extensive overhauls were performed for the following naval vessels: U. S. submarines *S-10*, *S-11*, *S-13*, *S-15*, *S-16*; barges *YO-11*, *YF-225*; houseboat *YHB No. 1*; and dragboats *No. 7* and *No. 8*. Interim dockings and light repairs were given U. S. submarines *S-12*, *S-14*, and *S-48*, and to the U. S. S. *Mallard* and U. S. S. *Teal*.

Repairs to Army vessels.—At the Balboa shops the Army transport *Republic* was docked, a broken propeller blade removed and new one fitted in its place; running repairs were made to the transports *Chateau Thierry* and *Ludington*, and the mine planter *H. C. Schumm* was dry-docked and given a general overhaul. In addition to the foregoing, drydocking and/or overhauls were given the following equipment of the Army: *D. B. L-55*; inspection boat *Q-2*; *M. P. Graham*; *M. P. Getty*; and *M. V. Morgan Lewis*.

Repairs to other Government vessels.—This work included the dry-docking and overhauling of the U. S. lighthouse tender *Acacia* and changing her propeller; and the drydocking and overhaul of the U. S. Coast Guard cutter *Nemaha*.

Repairs to foreign government vessels.—At the Balboa shops routine drydocking and incidental overhaul of the Peruvian cruisers *Almirante Grau* and *Almirante Villar*, gunboat *Parinas*, and submarines *R-1*, *R-2*, *R-3*, and *R-4* were performed. The machinery repairs on the *Almirante Villar*, including docking and repair expense, exceeded \$30,000. For the Mexican Government, the new Mexican Coast Guard cutters *G-20*, *G-21*, *G-22*, and *G-23* were drydocked and their bottoms cleaned and painted. The Colombian Government destroyers *Antioquia* and *Caldas* were drydocked and given major overhauls.

Marine work for Canal divisions.—A new 1,000-yard steel dump scow, from N. R. A. funds, totaling \$121,566.31, and a new floating hydraulic grader known as “grader No. 4”, costing \$130,765 plus additions for features added to original design, were completed at the Balboa shops for the dredging division. A new self-dumping silt barge was built for the same division at Balboa at a cost of \$42,679.96, and cast-steel hawse pipes for the self-housing anchors of the crane ship *Atlas* were manufactured and installed. Heavy overhaul and partial reconstruction were performed on dredging division 1,000-yard barges 106, 118, 132, 133, 135, 136, 137, and 138. Drydocking at Balboa and annual overhaul were given dredging division dredges *Paraiso*, *Cascadas*, and *Las Cruces*, drillboat *Terrier No. 2*, and tugs *Bohio* and *Trinidad*. Two new main dredging pumps were made for the *Las Cruces*, the casting for the bottom half of the casing for this pump being the largest steel casting (about 7 tons) ever produced in the Canal shops. The casting for a cutter head for the dredge *Las Cruces* exceeded the maximum capacity of the foundry and had to be cast in 2 sections, the 2 sections being later welded together by electric welding. This is the first attempt with this type of construction and if the cutter stands up satisfactorily in service, it is anticipated that future cutter heads will be manufactured by the mechanical division.

Construction was begun at Balboa on two Diesel electric tugboats, the *Arraijan* and the *Alhajuela*, the estimated cost for both being \$536,500, or \$268,250 each. A new 50-foot launch, the *Pato Real*, was built for the marine division at Balboa, and a 30-foot launch, the *Paja II*, for the police department.

OTHER WORK

The usual amount of light and heavy repairs was afforded locomotives of the Panama Railroad. In addition, locomotives were overhauled for the United States Army and for the dredging division. During the year a large number of surplus Panama Railroad cars was retired and scrapped. These included fifty-five 30-ton box cars, thirty-five 50-ton box cars, 9 labor cars, 67 flat cars, 9 gondola cars, 19 log cars, 4 ballast cars, twenty-five 12-yard steel side-dump cars, and thirty-six 19-yard steel side-dump cars.

During the first half of the fiscal year, a large number of repair parts was manufactured or reconditioned for use during the overhaul of the Atlantic Locks, and the building of a new electric towing locomotive for the locks was begun. A large amount of material was manufactured for Madden Dam. Welded-steel concrete forms of a complicated nature were devised and manufactured for use in placing concrete bellmouths intended to stop the erosion that was found taking place at the upstream openings of the sluice gates at Madden

Dam and flexible circular bulkheads were made to go over the bars of the sluice gate trash rack to permit unwatering the pair of sluice openings which were worked upon.

Incidental to dredging of gravel supply from the bed of the Chagres River above Gamboa, the railroad wrecking cranes and wrecking outfits removed the middle section of the Gamboa bridge (weighing 60 tons) and deposited it on a barge to permit the dredge *Las Cruces* to pass upstream and then replaced the bridge without delaying passenger service. The operation was repeated to permit the return of the *Las Cruces* upon the completion of the gravel operations.

PLANT IMPROVEMENTS

A 35-ton crane for service on the drydock wall and fitting out pier at the Cristobal shops was designed at Balboa and brought to about 70 percent completion during the year (estimated cost \$88,500). This crane will have a capacity of 35 short tons at a 55-foot working radius from the center of the 16-foot gage track on which it travels, which amounts to about 45 feet reach over the side of the drydock or fitting out pier.

In order to protect the Balboa and Cristobal shop areas from trespass and depredations, it is planned to enclose both areas with a steel mesh fence, with overhanging barbed wire at the top. This work was partially completed at the close of the fiscal year.

The remainder of the pier of timber construction at the Cristobal shops, known as Dock 14, was completed, the crane tracks laid on it, and the pier was used during the latter part of the year. Of the 800 feet contemplated for concrete Pier 15 at Cristobal shops, 375 feet remain to be completed, and it is hoped that funds can soon be secured to permit building the remainder of this much-needed pier.

TREND OF WORK

The trend of the work in the mechanical division is downward as is shown clearly by the accounts. Increased labor costs under the 40-hour week law has added appreciably to the cost of marine repair and other work performed in the Canal shops, and as a result the work performed for private shipping is being restricted for the greater part to emergency or running repairs.

Notwithstanding the falling off in marine repair work, the transfer of a considerable number of men to the locks for the overhaul during the first 4 months of the calendar year 1935, and of a smaller number to Madden Dam over a longer period, made it possible to provide steady employment throughout the year for practically the entire force. As there will be no overhaul of the locks during 1936, it follows that unless there is an increase in marine repair or other

work, it will be necessary to resort to furloughs or to reduce the force during the next fiscal year.

During the year, the forces of only the machinists and car repairers were slightly increased. The increase in machinists was due to making up some of the attrition which has been going on for several years; and the increase in car repairers was caused by the necessity of resuming heavy repairs to freight cars, which class of work had been previously suspended for some time. There has been almost an absence of transfers into or out of the mechanical division and few resignations. It is noteworthy that in a gold force of over 400 employees, only 1 individual resigned or otherwise voluntarily separated himself from employment during the year.

FINANCIAL

Due to a change in accounting procedure, the 1935 figures pertaining to revenue received are not strictly comparable with corresponding figures for previous fiscal years. This is because of change instituted of making monthly billings of amounts due instead of billing at the end of the job. Due to that accounting change, the table showing revenues for the fiscal year 1935 includes a carry-over from work performed during the fiscal year 1934, making it somewhat inaccurate for comparison with previous years and, moreover, it conveys the impression that the quantity of work held up somewhat better than was actually the case.

Without making allowance for the change in accounting practice, the value and class of work done, and the sources of the same, for 1935 and for the 2 previous fiscal years, are shown in the following table:

	1933	1934	1935
Class of work completed:			
Marine.....	\$1,780,519.25	\$1,598,155.48	\$1,683,362.23
Railroad.....	430,051.40	309,030.68	370,207.80
Fabricated stock.....	340,737.30	129,758.38	247,239.27
Sundries.....	384,429.67	449,817.77	488,821.33
Total.....	2,935,737.62	2,486,762.31	2,789,630.63
Origin of work completed:			
Panama Canal.....	1,385,288.93	1,239,810.51	1,539,242.45
Panama Railroad ¹	448,735.58	332,019.20	377,617.95
Other United States Government departments.....	779,517.95	551,067.96	467,217.39
Outside interests.....	322,195.16	363,864.64	405,552.84
Total.....	2,935,737.62	2,486,762.31	2,789,630.63

¹ The revenues from the Panama Railroad Co. include the receiving and forwarding agency, coaling plants, commissary division, plantations, and Hotels Tivoli and Washington, as well as work for the railway activities. The revenue from the Panama Railroad Steamship Line is included with "outside interests."

The total expenditures of the mechanical division amounted to \$2,553,321.93, which is \$62,682.21 less than the preceding year. The

flat-rate activities of the division, which include the drydocks, foundries, locomotive cranes, automobiles, etc., earned profits totaling \$65,581.14 and the Canal expense surcharge yielded a profit of \$84,393.89. The net earnings of the mechanical division after deducting \$72,536.94 for authorized replacements were \$51,232.21. There was no revision of wages during the year, and machine-tool rates remained as in the previous year.

ELECTRICAL INSTALLATION AND REPAIR WORK

The principal activities of the electrical division are the operating and maintaining of the hydroelectric and Diesel-electric power plants, substations, transmission lines, and power-distribution systems; the operation and maintenance of telephone, telegraph, electric-clock, fire-alarm, and railway-signal systems; the operation and maintenance of Gatun Spillway and Madden Dam; and the installation and maintenance of such electrical equipment as is required by other divisions of the Canal or other departments of the Government, and by such commercial vessels as may require electrical work performed while transiting or calling at the Canal. The total expenditure of the electrical division for the year was \$1,221,801.26, which included \$492,159.73 for maintenance and operation of the power system; \$573,642.59 for construction and maintenance of electric work section; \$116,859.64 for the maintenance and operation of the telephone section; and \$35,050.79 for the maintenance and operation of the railway-signal section. Economy act savings totaled \$21,791.99.

Work was started during the year in connection with the installation of two 5,333-kilovolt-ampere transformers at Balboa substation, which work includes replacement of switch gear connected therewith and rearrangement of switch gear for the synchronous condenser in that station. Modern metal-clad switch gear was installed at the Summit substation; this apparatus replaced obsolete switch gear at this station and provided facilities for two new feeders for serving the new naval radio station at Summit. Approximately 8 miles of the transmission line, between Cristobal and Mindi, and between Miraflores and Balboa, were equipped with an additional ground wire over the middle wire of each of the two transmission lines. The addition of this second ground wire is to further reduce interruptions to the transmission line service by lightning.

Considerable underground distribution work for electric power and lighting, telephone, and street lights was performed in connection with the 1935 building program at Gatun. At the time of raising and rebuilding the Randolph Road, the duct line along it was also rebuilt. The 11,000-volt overhead pole line to Coeo Solo, which parallels the road, was relocated in part to eliminate road crossings. In connection with the flood-warning system for long-distance transmitting,

indicating and recording of water levels between Madden Dam and stations at up-river points, two multiple-conductor armored submarine cables were laid on the bed of Madden Lake to replace two temporary pole lines. The 11,000-volt pole line from Summit substation, serving dredging activities along the Canal was rerouted to clear the navy radio reservation at Summit. The transfer of the restaurants to the bureau of clubs and playgrounds necessitated considerable change in the location of electrical cooking equipment at Balboa. The Ancon restaurant building was altered to accommodate not only the restaurant but also the clubhouse with its diversified activities.

A total of 398 jobs was completed in the marine electric shops for Government vessels and commercial vessels calling at or transiting the Canal, 247 of which were handled at the Pacific terminal and 151 at the Atlantic terminal. Among the more important of these jobs were the installation of the electrical equipment in the new hydraulic grader built by the mechanical division; the overhaul of the electrical equipment on the dredge *Las Cruces*; and the annual overhaul and necessary repairs to electrical equipment on the submarines U. S. S. *S-10*, *S-12*, *S-14*, *S-15*, and *S-16* for the United States Navy.

Other electrical work included the wiring and fixture installation in the 72-room bachelor quarters in Cristobal and one type 108 official quarters in Colon Beach, and the conversion of Building 1728, Cristobal, for use of the constructing quartermaster as an office and shop.

Installation of electric ranges and water heaters in Panama Canal quarters was continued throughout the year, and at the end of the year there were 125 of the two-burner type, 1,833 of the four-burner type and 9 of the six-burner type.

PURCHASES AND INSPECTIONS IN THE UNITED STATES

The principal purchases of supplies for the Panama Canal have been made by the Washington office, as heretofore. Offices in charge of assistant purchasing agents have been continued at New York and San Francisco. While these offices have not been called upon to make many purchases for the Panama Canal during the present fiscal year, they have acted as receiving and forwarding agencies for materials which have been purchased by the Washington office for forwarding to the Isthmus through their respective ports. The office of assistant purchasing agent at New Orleans was abolished in November 1933, and the assistant freight traffic manager of the United Fruit Co. continued to act for the Panama Canal as receiving and forwarding agent in connection with material and supplies forwarded to New Orleans for transshipment to the Isthmus. The Panama Canal, medical section, New York General Depot, United States Army, Brooklyn, N. Y., has continued, as heretofore, to make purchases of

the principal medical and hospital supplies which are used by the Panama Canal on the Isthmus, these purchases being made upon requests from the Washington office, which are based on requisitions received from the Isthmus.

The force of inspectors in the field, under the supervision of the inspecting engineer located at Washington, has been continued as in the past for the purpose of making preliminary inspection of materials in the United States covering purchases where delivery is required on the Isthmus. This force also makes final inspection of materials where delivery is made in the United States. The large majority of purchases are, however, made for delivery on the Isthmus in accordance with the long-established policy of permitting competition for the Canal's requirements on even terms in all sections of the country. The field officers of the Corps of Engineers, United States Army, the National Bureau of Standards, the Bureau of Mines, the Bureau of Chemistry of the Department of Agriculture, the Medical Department, United States Army, and the Bureau of Construction and Repair and Bureau of Engineering, Navy Department, have also assisted in connection with the inspection work in the United States. The total number of orders placed in the Washington office during the year was 8,104, being an increase of 1,343 as compared with the fiscal year 1934. The number of orders placed during the present fiscal year is the largest placed during any fiscal year since 1920, and also exceeds the number of orders placed during any fiscal year since 1904 (when construction work was begun), with the exception of the fiscal years 1916, 1917, and 1920.

The total value of orders placed in the Washington office during the year was \$4,215,332.12, as compared with \$3,201,636.97 for the fiscal year 1934. The grand total of purchases by the Washington office since the year 1904 is \$224,675,612.71. This grand total does not include the amount covered by orders placed by assistant purchasing agents at New York and New Orleans and by the Panama Canal, medical section, New York General Depot, United States Army, Brooklyn, N. Y., but includes orders issued by the Washington office only. The total value of orders placed by the above-mentioned agencies during the fiscal year 1935 was \$70,018.46 and the total of such orders covering the period from 1904 to June 30, 1935, is \$4,323,617.98.

The sale of surplus Canal material by the purchasing department in Washington during the fiscal year 1935 amounted to \$3 based on one sale order. Four sale orders were placed during the previous fiscal year, amounting to \$74,000.37.

The assistant comptroller's office prepares all vouchers for payments to be made in the Washington office; keeps all records relative to payments and financial transactions; conducts correspondence

relative to payments of claims; has charge of collections; examines and approves transfer settlements; gives the disbursing clerk's accounts an administrative examination before submission to the audit division of the General Accounting Office; prepares the statistical data required to show the distribution of the expenses of the Washington office, claims division, for settlement; prepares all contracts and bonds; has charge of all work in connection with deposit for tolls made with Federal Reserve banks; and passes upon all legal questions involved in the transactions of the business of the Washington office of the Panama Canal. During the fiscal year, 10,853 disbursement vouchers amounting to \$4,390,387.51, were prepared, and 295 collection vouchers were prepared, amounting to \$193,949.74. In addition to the collection vouchers, 9 collections aggregating \$10,274.52 were made by transfer of appropriation through the General Accounting Office, making the total amount collected \$204,224.26, on 304 accounts.

Change in quarters.—On June 25, 1935, the Washington office began an enforced move from the quarters which it occupied in the Munitions Building since 1924 to new quarters in a five-story building located at 1435 K Street NW. This building is inadequate to properly house the Washington office, and it was necessary to assign to this office additional space for storage in a warehouse located about a block away.

SHIP CHANDLERY AND OTHER STOREHOUSE SUPPLIES

During 1935, the operation of the storehouse was continued under the same general policy as in previous years. On June 30, 1935, the book value of stock on hand at all storehouses was \$4,229,033.79 as compared with \$3,488,060.69 on June 30, 1934. The total value of all materials received on requisition from the United States was \$4,186,608.15. Local purchases were made totaling \$382,972.74. Scrap and obsolete stock remaining on hand at the end of the year totaled \$15,477.15. During the year, 208 net tons of American scrap iron were sold in the local market.

The general storehouse at Balboa (including the medical storehouse) and the branch storehouses at Cristobal and Paraiso handled a total of 126,168 requisitions and foreman orders during the year. Material and supplies sold to steamships, employees, and others aggregated \$730,939.07. The sales to steamships amounted to \$48,730.33, involving 1,724 sales, an increase over the previous year of \$20,564.34. Of the increase, \$12,554.67 was handled at the general storehouse, Balboa, and \$8,009.67 at Cristobal.

A new one-story steel and concrete oil paint storehouse, 62 by 200 feet, was erected at Mount Hope during the year.

Native hardwood lumber operations were continued in the Canal Zone, and 185.699 board feet of logs at \$35 per thousand board feet

were purchased. Cement consumption for the year amounted to 68,938 barrels.

For the year's operations, revenues exceeded expenditures by \$111,852.07 (see table 26, sec. V).

OBSOLETE AND UNSERVICEABLE PROPERTY AND EQUIPMENT

During the year disposition was made by sale, or by destruction where the items had no money value, of obsolete or unserviceable property and equipment which had an original value of \$577,654.67. Replacements were made as necessary.

FUEL OIL, DIESEL OIL, GASOLINE, AND KEROSENE

Fuel and Diesel oil.—All deliveries to and from tanks, for private companies as well as for the Panama Canal and the United States Navy, are handled through pipelines and pumping plants of the Panama Canal. The total fuel and Diesel oil handled by the Balboa and Mount Hope plants, including both receipts and issues, aggregated 9,713,542 barrels, as compared to 9,710,246 for the preceding year. The operations are shown in detail in the following tabulation:

	Balboa	Mount Hope	Total
	<i>Barrels</i>	<i>Barrels</i>	<i>Barrels</i>
Received by the Panama Canal.....	169,639.34	274,251.86	443,891.20
Used by the Panama Canal.....	126,271.69	260,457.58	386,729.27
Pumped for individuals and companies.....	3,224,262.37	5,589,590.67	8,813,853.03
Sold by the Panama Canal.....	10,247.40	11,084.31	21,331.71
Miscellaneous transfers.....	35,453.19	12,284.24	47,737.43
Total receipts, deliveries, and transfers.....	3,565,873.98	6,147,668.66	9,713,542.64

The number of ships discharging or receiving fuel oil (including Diesel oil) during the year totaled 1,765, of which 62 were Panama Canal craft.

Gasoline and kerosene.—Bulk gasoline and kerosene received on the Isthmus during the year totaled 3,449,268 and 1,005,138 gallons, respectively.

Storage facilities.—During the fiscal year the Union Oil Co. completed the erection of a 2,900-barrel kerosene tank at the Balboa tank farm and the Union Oil Co. completed a 59,000-barrel tank for Diesel oil at the Mount Hope tank farm. The Asiatic Petroleum Co. dismantled a 55,000-barrel tank and erected in its place an 80,000-barrel capacity tank for Diesel oil at Mount Hope.

BUILDING CONSTRUCTION AND MAINTENANCE

The principal projects of building construction and repair work completed during the year consisted of one gold family quarters, Colon Beach; high school and junior college, Balboa; elevation to 7 feet of 48 type 17 frame cottages in Balboa and placing thereunder concrete footings equipped with termite prevention plates; painting exteriors and roofs of many gold quarters, all districts; extensive interior painting of gold quarters, all districts; addition and alteration to Balboa clubhouse for restaurant purposes; new gasoline filling station, Cristobal; converting Pedro Miguel restaurant building into district quartermaster's office and post office; and the conversion of the concrete restaurant building, Ancon, into a combined clubhouse and restaurant.

Work on the following projects is now under way and will be completed during the fiscal year 1935-36: New roof on Pier No. 7, Cristobal; new roof, ventilators, and skylights on Dock 9 Annex, Cristobal; repairing of 23 silver family apartments at Camp Bierd, Cristobal; new copper roof on Cristobal retail commissary; truck shed, Cristobal corral; constructing extension and placing new roof on Panama Railroad local freight house, Panama; and burglar-proofing of gold family quarters in the New Cristobal area.

TERMITES

The work of prevention of damage to frame buildings by termites was continued. All gold family cottages on Morgan Avenue and Plank Street, Balboa, which were elevated and equipped with concrete footings and closed garages underneath, were protected against termite infestation by placing metal plates between the new concrete posts and the frame superstructure, the same as is done with all new composite construction. This method is proving very successful in termite prevention and resulting in a large saving in maintenance expense. Periodical inspections are made and where damaged, prompt attention is given to rebending and soldering of the metal plates as a precaution against termite infestation.

QUARTERS FOR EMPLOYEES

Gold employees.—The family quarters situation, as far as number of apartments is concerned, is comparatively easy. However, many employees and their families are quartered in old houses where expenditure for further maintenance is false economy. Last year, 15 new family apartments were erected at Gatun and at the present time 50 new family apartments, 16 bachelor apartments, and one 16-room

bachelor quarters are under construction by contract, which will leave about 85 old family apartments at Gatun that should be replaced. It is proposed to erect 57 more new family apartments at Gatun during the fiscal year 1935-36.

Silver employees.—For a number of years an item of \$95,000 was included in the Panama Canal appropriations to cover the annual deficit incurred in connection with silver quarters operations. This item was eliminated for the fiscal year 1934 and necessitated severe curtailment of maintenance work on such quarters. As funds available were insufficient for necessary maintenance work, a flat increase of 15 percent in rental rates was made August 1, 1934. Subsequently a survey of all silver quarters was undertaken with a view to adjusting rental rates so as to provide sufficient revenue to place these quarters on a self-sustaining basis. All buildings were measured, and new rental rates were established as of July 1, 1935, with consideration given to the desirability of the quarters, the amount of floor space therein, and an equitable distribution of the costs of water, electric current, garbage removal, etc. All but a few of the houses for silver employees are of frame type construction and ordinarily contain from 4 to 12 apartments of two rooms each. Under the new rental rates effective July 1, 1935, the two-room apartments in the new or standard type houses will rent from \$6.75 to \$8.50 per month, which includes the cost of water and electric current used by the occupants, and general upkeep of the quarters.

The demand for family quarters from silver employees is greatly in excess of the facilities available. On June 30, 1935, there were 2,854 family apartments; 610 rooms for bachelors; 218 beds or cots and 585 bunks in barracks. At the close of the year, there were 1,262 applications on file for quarters from these employees. Over 50 percent of the silver employees must, of necessity, reside in Panama City and Colon where rental rates are considerably higher than those charged for Government quarters in the Canal Zone.

REPLACEMENT OF QUARTERS FOR AMERICAN EMPLOYEES

About 10 years ago cost records, etc., indicated that the cost of maintaining the oldest frame quarters for American employees had reached the point where replacement was the most economical procedure. Some of these old quarters were built by the French Canal Co. and by the Panama Railroad before the United States acquired the Canal Zone in 1904. There were also in use a large number of construction camp type of frame houses built during the first years of American operations and large numbers of similar houses built prior to 1915. Some of these were re-erected houses which had been moved from towns that were abandoned upon completion of construction work. It was realized that their replacement would require an exten-

sive construction program over a period of years. The matter was placed before Congress and the first appropriation for replacement of quarters for American employees was made for the fiscal year ended June 30, 1927.

The first types of quarters designed and built for the permanent force were of concrete. On account of the large first cost of concrete buildings, designs were resorted to of concrete columns and first-floor beams with wood frame structure above. After experience in the construction and maintenance of various types of houses, and after giving consideration to original cost, upkeep, etc., the wooden structures supported on concrete beams have been adopted as standard, and are preferred by a majority of the employees. Concrete types are being retained for bachelors' quarters.

It is believed that the present scale of rental charges will be sufficient to cover depreciation as well as all other costs of maintenance and operation once the old frame buildings are replaced by the newer types.

The following is a summary of the new quarters constructed and of the old quarters remaining to be replaced after the current fiscal year.

Number of apartments for American employees' quarters

	Cristobal, New Cristobal, Colon Beach		Gatun		Gamboa		Pedro Miguel		Ancon-Balboa		Total	
	Family	Bachelor	Family	Bachelor	Family	Bachelor	Family	Bachelor	Family	Bachelor	Family	Bachelor
Total number to be replaced June 30, 1936.....	347	276	148	23	0	0	135	60	468	472	1,058	831
Replacements:												
1927.....	49										45	
1928.....	80										80	
1929.....	65										75	
1930.....	16								10			
1931.....	1								30	40	46	40
1932.....	46								70		71	
1933.....	10	100							25		71	
1934.....	1		15						12		22	100
1935.....			50	1 32					10		26	
1936.....			57		26	24			1		51	32
											83	24
Total replacements.....	298	100	122	32	2 26	24	2 109		158	40	574	196
Remaining to be replaced after 1936.....	79	176	26	0				2 36	310	432	524	614

¹ Includes additional bachelor quarters required at Gatun on account of increase in lock force because of 40-hour week.

² The quarters built at Gamboa will replace quarters at Pedro Miguel and other districts.

The quarters to be built at the new townsite of Gamboa constitute a replacement of old quarters in other districts from which employees will be transferred to Gamboa.

The total cost of constructing the quarters between 1927 and 1936, inclusive, shown in the table, including the estimated cost of completing the quarters to be built during the fiscal year 1936, has been \$4,878,824.26, not including townsite extension, general grading, or exterior electrical work. The construction cost includes necessary furniture installed in the quarters.

It is estimated that it will cost about \$6,000,000 to complete the replacement of the 524 family and 644 old bachelor apartments shown in the table as in need of replacement. This includes about \$500,000 for grading work, road, sewer, and water line replacement, and contingencies, such as probable price increases for material as business recovers. So far as the Panama Canal is concerned, it will be convenient to pursue this work at the rate of about \$500,000 per year, which will extend it over a period of 10 or 12 years.

CONTRACT CONSTRUCTION

For many years, the construction by hired-labor method of all new buildings for the Panama Canal and the Panama Railroad was handled by the constructing quartermaster's division of the Canal organization.

During the fiscal year 1934, comparatively little new construction work was authorized, and at the end of the year the forces had shrunk to maintenance proportions. For the fiscal year 1935 allotments were received for 25 two-family, 2 one-family, and 2 bachelor quarters for American employees at Gatun and for an oil and paint storehouse at Mount Hope. It was, therefore, deemed more economical for the Government to contract the construction of these buildings than to expand the construction force of the constructing quartermaster's division to perform this work.

Accordingly, three separate contracts were entered into for the construction of the buildings under plans and specifications prepared by the Panama Canal. These provide that the Panama Canal will furnish all material entering into the construction of the buildings; the contractor to provide necessary material of American manufacture for concrete forms, scaffolds, etc. According to estimates made, the construction costs of these buildings, including material, will be less than if the buildings had been erected by the Canal. Construction of the buildings by contract has progressed in a satisfactory manner, and plans and specifications were prepared and bids invited on 34 additional quarters buildings to be constructed at Gatun during the fiscal year 1936, to continue the replacement program at that locality.

CONVERSION OF RESTAURANT BUILDINGS

Transfer of the restaurant business to the bureau of clubs and playgrounds, on May 16, 1934, left several excellent restaurant structures available for other uses.

The buildings at Cristobal and Ancon were acquired by the bureau of clubs and playgrounds, as it was found more advantageous at those places to continue the restaurant activities in the buildings and to move the other clubhouse activities into the restaurant buildings after making some alterations. This was done, except that the moving-picture theaters could not be brought into the restaurant buildings. Plans are now under consideration to provide a permanent theater at Cristobal, and at Ancon it is intended to move the present frame moving-picture theater to a site near the restaurant building.

The restaurant building at Pedro Miguel was converted into a post office and district quartermaster's office. This was done during the fiscal year 1935 by installation of partitions and openings, post-office boxes, etc., at a total cost of \$11,878.08.

Plans have been prepared for converting the Balboa restaurant building into a permanent police station to replace the old frame building now used for this purpose. The estimated total cost of this is \$77,200.

MOTOR AND ANIMAL TRANSPORTATION

Motor and animal transportation for all departments and divisions continued to be supplied by the transportation division under the pool system. This division is charged with the operation and maintenance of practically all transportation equipment and is required to operate on a self-sustaining basis. The usual amount of heavy hauling in connection with various building projects was accomplished during the year.

During the year 25 cars and trucks were retired and 31 were purchased. At the close of the year there were on hand 321 cars and trucks, 4 trailers, 6 motorcycles, 4 mowing machines, and 10 mules. Revenues exceeded expenditures by \$45,911.88 as compared with a profit of \$74,922.83 for the preceding year.

THE PANAMA CANAL PRESS

The operations of the Panama Canal press were continued under the same policy as in previous years. At the beginning of the fiscal year 1934 the Canal Record was changed from a weekly to a monthly publication. The printing plant carries in stock and manufactures such necessary stationery, forms, etc., as are required on the Isthmus in connection with the operation of the Panama Canal and the

Panama Railroad. The manufacturing output for the current year amounted to \$152,089.56, as compared with \$144,985.09 for the previous year. The annual inventory value of material on hand at the close of the year was \$65,973.41, as compared with \$61,317.75 for the previous year.

REVENUES DERIVED FROM THE RENTAL OF LANDS IN THE CANAL ZONE

Rentals on building sites and oil-tank sites in the Canal Zone totaled \$41,632.25 for the year, as compared with revenues of \$45,166.50 in 1934. Rentals of agricultural lands in the Canal Zone totaled \$17,934.78 as compared with \$19,397.44 for the preceding year. At the close of the fiscal year a total of 1,435 licenses were in effect covering 3,248½ hectares of agricultural land within the Canal Zone. This is a reduction in the number of licenses under the previous fiscal year of 176, and a reduction in the area held under licenses of 388½ hectares.

The land office disposed of 70 claims for agricultural improvements on account of the construction of the townsite of Gamboa. All agricultural licenses within a radius of 1 mile of the limits of the townsite, excepting those on the Gaillard Highway were canceled. The total amount paid for the purchase of these improvements was \$27,962.55.

EXPERIMENTAL GARDENS

The work which the experimental gardens has been carrying on directly and in cooperation with the United States Department of Agriculture for a decade or more has, in a sense, come to fruition in the year just closed. Although many have believed that the commercial production of rubber in Central America would not be practicable, the testing of rubber-producing plants, especially *Hevea brasiliensis*, was carried forward in order that some experimental data, and also a supply of seed, might be available and ready for any development in the world rubber situation which might point toward the desirability of establishing rubber plantations in this region. During the year just closed representatives of one of the largest rubber-producing and manufacturing interests in the United States arrived on the Isthmus to investigate the adaptability of this country for *Hevea* rubber production, and also to look into the possibilities of establishing a plantation in Panama.

At the experimental gardens these experts found small plantings of *Hevea brasiliensis* which in their opinion compare favorably with growths of similar age in the best plantations in the Orient. It is believed that these demonstrations of the behavior of the trees in this country had considerable weight in their reaching a decision to

establish a plantation of several thousand acres in the Republic, in the vicinity of Gatun Lake. The gardens were also able to supply a considerable quantity of seed and entered into an arrangement with the company whereby a nursery was established at the gardens, thus saving at least a year in getting the project under way. It is of great importance in any Hevea-planting project to have a supply of seed reasonably near at hand, as these seeds so rapidly lose their viability. It is difficult to predict the outcome of any rubber-planting project in this country, or its significance to commerce and to the agricultural prosperity of Panama. It seems likely, however, that if rubber production is made economically successful in this country, it will open an entirely new field of wealth to the Republic of Panama as well as being advantageous from the viewpoint of developing another source of rubber supply.

Arrangement for the establishment of the rubber tree nursery was made on a basis similar to that followed in caring for plantings of other outside interests, the company paying a fair rate for the service performed. The rubber company also agrees to leave with the gardens, specimen trees grafted to the highest-yielding clones being introduced from their selected plantings in the Philippines. At the close of the year, the Hevea nursery comprised upwards of 30,000 seedling trees, ranging from 3 to over 6 feet in height.

CLUBHOUSE RESTAURANTS

With the abrogation in the latter part of 1934 of the private contracts for operating the restaurants on the Canal Zone, this business was taken over by the bureau of clubs and playgrounds and operated as a business activity. In 1935, the first full year of operation, the receipts were \$327,550.52 and the expenses \$326,770.63, leaving a net profit of \$779.89.

BUSINESS OPERATIONS UNDER THE PANAMA RAILROAD CO.

Many of the business activities on the Isthmus connected with the operation of the Canal are conducted with funds of the Panama Railroad Co. Included in these are the wharves and piers at the harbor terminals (except the wharves at Balboa which are operated by the Panama Canal), the commissary system, coaling plants, hotels, and various minor activities, as well as the Panama Railroad itself. In this report only the major features of these operations are noted in their relation to the Canal administration as a whole. Details are given in the annual report of the Panama Railroad, which is published separately.

The operations of the railroad proper, harbor terminals, coaling plants, stables, and baggage transfer were continued throughout the

year under the direction of the general manager of the railroad; the telephone system under the electrical engineer of the Panama Canal; renting of lands and buildings under the land agent; and commissaries, Hotels Washington and Tivoli, and subsidiary activities under the chief quartermaster of the Panama Canal.

Business operations on the Isthmus, carried on with Panama Railroad funds, yielded a profit of \$899,195.79 for the fiscal year, as compared with \$1,156,738.14 during the previous fiscal year, a decrease of \$257,542.35, or 22.3 percent.

A summary of the 1935 operations is given in the paragraphs following:

TELEPHONES AND TELEGRAPHS

The gross revenue from the operation of telephones, electric clocks, and electric printing telegraph machines amounted to \$242,385.39, and the total expenses were \$175,144.01, leaving a net revenue of \$67,241.38, as compared with \$64,809.52 for the preceding year, or an increase of \$2,431.86 over last year.

During the year 1,234 telephones were installed and 1,132 were removed, resulting in a net increase of 102 telephones for the year. At the end of the fiscal year the telephones on the system, maintained by this section, numbered 2,811 as compared with 2,709 at the end of last year.

RECEIVING AND FORWARDING AGENCY

Harbor terminals.—The gross revenue from harbor terminals operations during the fiscal year amounted to \$1,526,294.46; operating expenses were \$1,171,260.67, leaving a net revenue of \$355,033.79, as compared with \$358,579.72 in 1934.

There were 1,788,852 tons of cargo stevedored and transferred, as compared with 1,597,324 tons in 1934, an increase of 191,528 tons. During the year 4,439 cargo ships and 1,238 banana schooners were handled, as compared with 4,329 cargo ships and 941 banana schooners in 1934. Agency service was furnished to 150 commercial vessels, as compared with 195 in the preceeding year.

Canal Zone for orders.—As an aid in the distribution of goods to areas served by steamship lines using the Panama Canal or its terminal ports, there was established in 1925 the arrangement known as "Canal Zone for orders." Under this system merchandise is shipped to Canal Zone ports (Cristobal and Balboa) to be held there in warehouses of the Panama Railroad Co. for orders. Such cargo or integral parts of it may be withdrawn as the consignor or consignee may desire for forwarding to ports beyond Panama. Many different commodities were handled in this manner during the year; the total cargo received under the arrangement was 2,777 tons. This was a

decrease of about 66 percent from the tonnage received during the previous year, the large loss being due principally to the discontinuance on December 1, 1933, of local deliveries into the Republic of Panama and the Canal Zone. The revenue received for handling and storage amounted to \$8,422.77, as compared with \$18,882.40 for 1934, a decrease of 55 percent.

COMMISSARY DIVISION

The commissary division is charged with the ordering, storage, and sale of all food supplies, clothing and other similar items. In carrying out these functions it operates an abattoir, cold storage plants, various manufacturing plants, a laundry, wholesale warehouses, and retail stores. In general, sales are restricted to the operating and defense forces of the Canal, to other United States Government personnel stationed on the Isthmus, to the United States Fleet and other United States Government vessels. Sales to commercial steamships were restricted to cold storage, food, and other essentials and approximated \$350,000 during the year.

Net sales for the year totaled \$7,122,770.33 as compared with \$6,508,183.35 for 1934. Gross operating expenses including cost of goods sold, transportation expenses thereon, plant and processing expenses and costs, salaries and wages, depreciation, repairs, etc., aggregated \$6,888,566.77, resulting in a net operating profit of \$234,203.56 for the year's operations.

At the close of the fiscal year, the value of merchandise on hand was \$1,010,074.95. The relationship between sales and inventory indicates a theoretical stock turnover every 2.36 months.

Sales.—The distribution of sales as compared with the 2 preceding years was as follows:

	1933	1934	1935
United States Government (Army and Navy).....	\$964,376.75	\$664,593.94	\$704,814.46
The Panama Canal.....	562,851.24	496,083.02	730,142.37
The Panama R. R.....	180,451.53	234,266.73	301,315.52
Individuals and companies.....	493,475.57	406,556.18	246,994.81
Commercial ships.....	294,416.69	330,570.82	355,954.92
Employees.....	5,107,704.11	4,654,620.74	5,114,279.59
Total sales.....	7,603,275.89	6,786,691.43	7,453,501.67
Less discounts, credits, etc.....	289,895.05	278,508.08	330,731.34
Net revenue from sales.....	7,313,380.84	6,508,183.35	7,122,770.33
Supplies for expenses:			
Retail commissaries and warehouses.....			
General.....	33,971.25	38,404.70	41,845.61
Plants.....	1,640.31	2,276.22	2,585.50
Plants.....	21,679.97	23,328.41	22,359.80
Total.....	57,291.53	64,009.33	66,790.91
Loss by condemnation, pilferage, shrinkage, etc.....	105,536.52	77,922.59	57,612.84
Grand total.....	7,476,208.89	6,650,115.27	7,247,171.08

Purchases.—Purchases during the year aggregated \$5,058,557.99, an increase of \$623,029.17, or 14 percent, as compared with the previous year. The following tabulation shows the value of the various classes of materials purchased, and the market in which purchased, as compared with the 2 preceding years:

	1933	1934	1935
Groceries.....	\$1, 234, 567. 33	\$1, 253, 372. 31	\$1, 362, 659. 95
Candy and tobacco.....	307, 226. 56	324, 182. 64	295, 436. 93
Hardware.....	337, 195. 27	260, 035. 89	326, 924. 97
Dry goods.....	764, 973. 11	624, 581. 16	644, 941. 72
Shoes.....	146, 378. 30	161, 987. 18	191, 027. 72
Cold storage.....	1, 092, 113. 73	922, 678. 32	1, 071, 593. 04
Raw material.....	318, 784. 87	340, 647. 14	447, 224. 51
Cattle and hogs.....	124, 465. 53	9, 217. 64	103, 117. 02
Milk and cream.....	153, 383. 45	131, 058. 85	156, 517. 02
Dairy products.....	371, 241. 15	407, 767. 69	459, 115. 11
Total.....	4, 850, 329. 30	4, 435, 528. 82	5, 058, 557. 99
Place of purchase:			
United States.....	3, 798, 356. 49	3, 569, 568. 40	4, 096, 955. 52
Europe and Orient.....	482, 590. 29	472, 386. 34	410, 434. 74
Central and South America.....	131, 281. 11	101, 261. 13	104, 997. 69
Local.....	130, 894. 20	104, 353. 12	208, 835. 47
Panama Canal.....	70, 558. 08	67, 445. 14	64, 394. 57
Cattle industry.....	236, 646. 13	120, 514. 69	142, 940. 00
Total.....	4, 850, 329. 30	4, 435, 528. 82	5, 058, 557. 99

Cold-storage plant and abattoir.—During the year the purchase of a number of Panamanian beef cattle was made on a competitive bid basis. Requirements averaged approximately 200 head monthly throughout the year. Due to the sharp advance in the price of States' beef, sales of the States' product have dropped appreciably while sales of native beef have increased. As a result of the higher price for States' meats, abattoir activities showed a marked increase, and at the close of the year consideration was being given to the manufacture of sausage products here again.

Manufacturing plants.—The output of the various manufacturing plants and laundry during the year had a total value of \$1,297,408.45, as compared with \$1,095,201.90 for the preceding year, an increase of \$202,206.55, or 18.5 percent.

Among the principal products of the bakery were 4,408,391 loaves of bread, 119,393 dozen rolls, 34,936 pounds of cake, 16,290 dozen doughnuts, 285,290 pounds of soda crackers, and 51,815 dozen cookies. The value of the output was \$251,379.22.

In the coffee-roasting plant, 367,594 pounds of coffee were roasted for the Army. Of commissary brands of coffee, 222,012 pounds were roasted, an increase of 8,000 pounds. In the packing department, 1,622,072 packages of foodstuffs totaling 4,838,579 pounds were packaged.

The value of items manufactured in the industrial laboratory totaled \$239,958.69, an increase of approximately \$40,000.

Although there was a steady monthly increase through the year on Army laundry work, business as a whole for the year decreased about 25 percent on total number of pieces handled and \$14,000 in value of output, the total value being \$152,069.76.

The output of the ice-cream and milk-bottling plant included 92,270 gallons of ice cream, 974,144 quarts of milk, 29,168 quarts of cream, having a combined value of \$283,704.16.

HOTELS

The hotels Tivoli and Washington were operated by the Panama Railroad Co. without change of policy. These hotels are operated as adjuncts to the Canal for the purpose of providing suitable accommodations to people having business with the Canal, foreign visitors, American tourists, visiting Government officials, and others. The cost of operating the Hotel Tivoli during the year was \$156,351.26, or \$16,382.70 more than the revenue derived. The operating cost of the Hotel Washington was \$154,696.69, or \$28,131.24 more than the revenue derived. Operating expenses of both hotels include increases in unexpended reserves over last year, as follows: Tivoli, \$11,450.65; Washington, \$16,449.40.

The operation of the Hotel Tivoli by the Panama Railroad during the past 6 years shows a gross difference of expenses over revenues of \$219,984.65. However, included in the charges to expenses for the period is \$121,255.93 paid to the Panama Canal for amortization of the capital account for the building and equipment and a total of \$73,156.63 in unexpended reserves, leaving a total of \$194,412.56 of the expenses as charged still in the possession of the Government or an actual net deficit of \$25,572.09.

CATTLE AND BEEF

Native beef.—During the World War period the slaughter of native cattle was undertaken with a view to conserving the meat resources of the United States and for the purpose of avoiding unnecessary transportation of food supplies. Following the war period, the very considerable difference in the cost of native beef and of States' beef resulted in a considerable demand for the former product, although it is of inferior quality to the States' beef.

Purchase of live cattle in Panama was resumed in 1934 after having been discontinued for several years on account of price factors. During the year the commissary division purchased 2,350 head of cattle in Panama under competitive bids. Owing to advanced prices

in States' beef the sales of beef in the Canal commissaries at the close of the year were running about 80 percent native beef and 20 percent States' beef.

Chilled beef.—During the general economic crisis subsequent to 1929, beef prices in the United States declined considerably and resulted in greatly reducing the variation between the prices of States' and of local beef. This resulted in considerable demand for States' beef with a consequent decline in the consumption of local beef.

The local sale of beef from the United States increased also as a result of making chilled-beef purchases in place of frozen beef. Chilled beef is superior to frozen beef and is much preferred by the trade. Trial shipments of chilled beef from the States were commenced early in 1934 and after some experimentation it was found that chilled beef could be shipped successfully to the Canal Zone. During the past 2 years these shipments have been continued regularly, but at present the demand for chilled beef from the States is declining because of the comparatively high prices in relation to the prices of native beef.

MINDI DAIRY

Total milk production at the Mindi dairy amounted to 248,689 gallons, or an increase of 5,278 gallons over the previous year. Four pure-bred Jersey bulls and 102 head of pure-bred Jersey cows were purchased in the United States early in the fiscal year at a cost of \$10,225.90 and added to the dairy herd.

PANAMA RAILROAD LANDS AND LEASES

There were in effect at the close of the fiscal year 1935 a total of 1,453 leases and 17 licenses covering the use of Panama Railroad properties in the cities of Panama and Colon. The income derived by the Panama Railroad from these leases and licenses during the year was \$241,649.38. This represents an increase in revenue over the fiscal year 1934 of \$3,327.94.

During the year the railroad company allowed a discount of 33½ percent to all lessees who were paying the full commercial rental, who paid their accounts during the period for which the bills were rendered. Those properties rented at low rates under old leases were not given the reduction. The discount amounted to \$80,019.73.

Ten new leases and three revocable permits were issued during the fiscal year. Five leases on which no improvements had been erected were canceled upon the request of the lessee.

COAL

The sale of coal from the plants at Cristobal and Balboa totaled 43,696 tons, as compared with 52,657 tons in 1934, a decrease of 8,961 tons, or approximately 17 percent. Purchases during the year totaled 34,169 tons. Total revenue from the sale of coal and the extra charges for handling was \$359,778.24. The cost of sales, including operating expenses, was \$317,742.22, resulting in a net profit of \$42,036.02, as compared with a profit of \$88,691.61 in the previous fiscal year.

The prices of \$7.75 per ton at Cristobal and \$10.75 at Balboa remained in effect throughout the year.

The operating expenses of the coaling plants were decreased from \$69,313.49 in 1934 to \$62,824.82 in 1935.

THE PANAMA RAILROAD

The gross revenue during the fiscal year 1935 from the operations of the Panama Railroad proper (not including subsidiary business activities) amounted to \$1,280,669.58. The operating expenses were \$1,133,683.32, leaving a net revenue of \$146,986.26 for the year, as compared with \$287,474.79 for the previous year, a decrease of \$140,488.53, or approximately 49 percent.

Tonnage of revenue freight transported during the year amounted to 270,334, as compared with 296,247 in 1934, a decrease of 25,913, or approximately 9 percent.

Statistics covering the various features of railroad operations during the past 3 years are presented in the following table:

	1933	1934	1935
Average miles operated, Colon to Panama	47.61	47.61	47.61
Gross operating revenue	\$1,328,229.81	\$1,429,784.27	\$1,280,669.58
Operating expenses	\$1,204,305.19	\$1,142,309.48	\$1,133,683.32
Net operating revenue	\$123,924.62	\$287,474.79	\$146,986.26
Percent of expenses to revenue	90.66	79.77	88.52
Gross revenue per mile of road	\$27,898.12	\$29,729.75	\$26,599.17
Operating expense per mile of road	\$25,295.21	\$23,764.20	\$23,811.87
Net revenue per mile of road	\$2,602.91	\$6,028.55	\$3,087.30
Number of passengers carried:			
First class	168,344	162,501	184,355
Second class	194,765	196,597	211,959
Total	363,109	359,098	396,314
Revenue per passenger-train-mile	\$3.88	\$3.76	\$3.91
Revenue per freight-train-mile	\$9.47	\$11.83	\$9.26
Total revenue train mileage	186,598	183,143	182,659
Railroad revenue per train-mile	\$7.12	\$7.74	\$7.01
Railroad operating expense per revenue-train-mile	\$6.45	\$6.18	\$6.21
Net railroad revenue per revenue-train-mile	\$0.67	\$1.57	\$0.80
Freight, passenger, and switch locomotive mileage	282,502	280,358	279,281
Work-train mileage	11,266	6,318	8,686
Passenger-train mileage	108,257	111,076	111,581
Freight-train mileage	78,341	72,067	71,078

PANAMA RAILROAD STEAMSHIP LINE

The gross operating revenue for the steamship line for the fiscal year ended June 30, 1935, amounted to \$1,162,268.67, and the gross operating expenses amounted to \$1,519,902.49, resulting in a net deficit from operations of \$357,633.82. The operating deficit compared with the net loss for the fiscal year ended June 30, 1934, of \$319,562.14, shows a decrease in the net revenue of \$38,071.68.

For the year ended June 30, 1935, the tonnage carried by the steamship line amounted to 163,304 tons as compared with 118,606 tons in the previous year.

The steamship line carried freight and passengers for account of the Panama Canal and other departments of the Government of the United States at material reductions from tariff rates, which amounted to the important sum of \$482,469.52. Had regular tariff rates been received by the steamship line for such freight and passenger services performed for the Panama Canal and other Government departments, its income would have been increased by \$482,469.52 and its operations for the year would have resulted in a profit of \$124,835.70.

SECTION III

ADMINISTRATION

DEPARTMENTS

The organization of the Panama Canal on the Isthmus embraces five principal departments, namely, operation and maintenance, supply, accounting, executive, and health. An office is maintained in Washington, D. C. and the Panama Railroad Co., is so closely affiliated as to be practically a part of the organization.

OPERATION AND MAINTENANCE

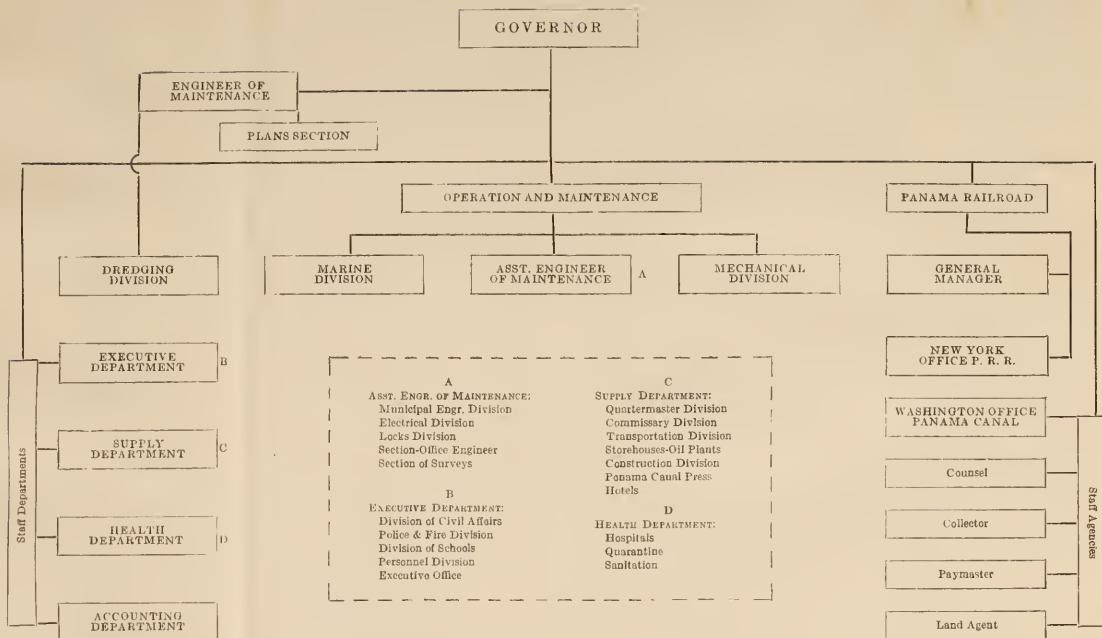
The department of operation and maintenance embraces functions related to the actual use of the Canal as a waterway, including the dredged channel, locks, dams, and aids to navigation, accessory activities such as shops and drydocks, vessel inspection, electrical and water supply, sewer systems, roads and streets, hydrographic observations, surveys and estimates, and miscellaneous construction other than the erection of buildings.

SUPPLY

The supply department is charged with the accumulation, storage, and distribution of materials and supplies for the Canal and Panama Railroad; the maintenance and construction of buildings; the assignment of quarters and care of grounds; the operation of storhouses, fuel-oil plants, hotels, commissaries, an abattoir, a bakery, an ice plant, an experiment garden, a laundry, a printing plant, and industrial laboratory, etc., and supplies motor transportation to the various departments and divisions of the Canal and railroad organizations.

ACCOUNTING

The accounting department is responsible for the correct recording of financial transactions of the Canal and railroad; the administrative auditing of vouchers covering the receipt and disbursement of funds preliminary to the final audit by the General Accounting Office; cost keeping of the Canal and railroad; the checking of time keeping; the preparation of estimates for appropriations and the allotment of appropriations to the various departments and divisions; and the examination of claims.



EXECUTIVE

The executive department embraces the general office business of the Governor and all administrative activities invested by Executive order within the authority of the executive secretary. Under this department come the administration of police and fire protection, postal service, customs, shipping-commissioner work, estates, schools, general correspondence, and records for the organization of the Canal and the Panama Railroad, personnel records and administration, wage adjustments, statistics of navigation, information and publicity, relations with Panama, and the operation of clubhouses, restaurants, moving-picture theaters, playgrounds, etc.

HEALTH

The health department has jurisdiction over all matters pertaining to sanitation and public health within the Canal Zone and the cities of Panama and Colon, the operation of hospitals and dispensaries, the enforcement of quarantine regulations, and the compilation of vital statistics for the Canal Zone and in the cities of Panama and Colon.

PANAMA RAILROAD CO.

The operations of the Panama Railroad Co. on the Isthmus are generally related closely to the work of the Canal, and the railroad organization is, in effect, a part of the Canal organization. The Governor is president of the Panama Railroad Co., the heads of departments in the Canal organization and of the railroad report to him. The general administration of the composite organization is centered in the executive office, and the accounting work in the accounting department; the Panama Railroad and other divisions of the general organization are billed for their proper share of the general overhead work.

CHANGES IN PERSONNEL AND ORGANIZATION

The following changes in organization and administrative personnel occurred during the year:

Division of personnel administration.—Primarily for the purpose of developing a more thorough system of personnel selection and administration, there was created in September 1934 a division of personnel administration. Its duties are the supervising and coordination of personnel functions of the entire organization. It is charged with supervision of matters of employees' salaries and wages, organization, promotions, demotions and terminations, efficiency ratings, transfers, seniority, leave, authorization of transportation, retirement, citizenship, vital statistics, the investigation of complaints, and with

related research looking to effective handling of these matters. The division has obtained the services of a personnel administrator, experienced in practices of industrial corporations in the United States, as consultant and has undertaken various revisions of practices in the endeavor to attain a more effective utilization of employees.

Mr. Seymour Paul, formerly chief of the bureau of statistics, is in charge of the division.

Plans section.—The plans section was created in October 1934. It is an auxiliary administrative agency reporting directly to the engineer of maintenance. Its function is to assist the department heads in the conduct of surveys and investigations with a view to obtaining a clear picture of existing conditions and to make recommendations leading to increased efficiency in operation, closer coordination of departmental and interdepartmental activities, improved accounting methods, and a resultant reduction in expense. There has been a growing need for some time for such a section. The following duties have been assigned to it:

(a) In collaboration with the responsible department heads, to make studies and investigations of financial, physical, and operating features of all divisions of the Panama Canal and Panama Railroad.

(b) To follow up and report on operating results from action taken by the Governor on such studies.

(c) To prepare and maintain operating indexes showing currently the efficiency of operation of important features of each division of the Panama Canal and Panama Railroad and to furnish such indexes to divisions.

(d) To maintain a logical and feasible 6-year program in detail and a 15-year program in general for future major betterments or extensions.

(e) To coordinate annual estimates of appropriations needed for replacements and betterments, and annual estimates of items to be charged against reserves.

Mr. Lewis B. Moore, formerly assistant office engineer, was appointed chief of the section. Most of the work performed during the fiscal year 1935 was in connection with the Panama Railroad Co. During 1936 studies will be made of various divisions of the Panama Canal. The personnel employed in the section has been held to a small number of carefully selected men. The information and results obtained from the studies and investigations already made have clearly demonstrated the value of the section.

Counsel.—The office of counsel the Panama Canal was established by the Governor on October 1, 1934, and Mr. F. H. Wang was appointed to the office. The counsel, the Panama Canal is the legal adviser in matters pertaining to the administration of the Panama Canal and performs such other duties concerning legal and legislative

questions and matters of public policy as may be directed from time to time by the Governor. The duties of the counsel are separate from those of the district attorney, who, under the law conducts all legal proceedings for the Government of the United States and the Government of the Canal Zone.

Madden Dam division abolished.—The Madden Dam division was abolished June 30, 1935, and the employees of this division whose services were needed in connection with the completion of construction work on the dam, operation of the hydroelectric plant, etc., were transferred to other divisions of the Canal organization. Mr. E. S. Randolph, construction engineer, was transferred to the position of designing engineer, the Panama Canal at the close of business June 30, 1935.

Appointments.—Capt. Walter F. Jacobs, United States Navy, was appointed assistant to the Governor on October 9, 1934, and on October 22, 1934, was appointed marine superintendent, vice Capt. William Ancrum, United States Navy, upon relief of the latter from duty with the Panama Canal.

Lt. Comdr. Charles F. Osborn, Construction Corps, United States Navy, was appointed superintendent of the mechanical division on July 2, 1934, vice Capt. R. W. Ryden, Construction Corps, United States Navy, upon relief of the latter from duty with the Panama Canal.

Mr. Fay E. Powell was appointed constructing quartermaster December 1, 1934, vice Mr. J. B. Fields, retired.

Change of title.—On December 15, 1934, by authority of the President, the title of the head of the accounting department was changed from auditor to comptroller, the Panama Canal, as more appropriately defining the duties of that official as auditor, budget officer, and financial adviser to the Governor. The title of assistant auditor on the Isthmus and that of the assistant auditor in Washington were accordingly changed to assistant comptroller.

FORCE EMPLOYED

The supervisory, technical, higher clerical, and highly skilled mechanical employees, who are primarily citizens of the United States but include Panamanians and a few of other nationalities, are employed on what is known as the "gold roll." The rest of the force, principally natives of the Tropics but including a few citizens of the United States, engaged on low-paid work, are designated "silver" employees. These terms are derived from the former tropical practice of paying Americans and Europeans in gold, while the native or tropical labor was paid in local currency, usually based on silver.

GOLD EMPLOYEES

The distribution of the gold personnel on June 20, 1934, and June 5, 1935, and comparisons for the 2 years are shown in the following tabulation:

Department or division	Gold force		De-crease	In-crease	Net in-crease
	June 20, 1934	June 5, 1935			
Panama Canal:					
Accounting department.....	152	159		7	
Dredging division.....	156	162		6	
Engineer of maintenance, assistant:					
Office engineer.....	28	36		8	
Surveys—meteorology.....	17	23		6	
Electrical division.....	144	155		11	
Locks division.....	240	268		28	
Municipal division.....	99	114		15	
Executive department:					
Executive offices.....	115	129		14	
Clubs and playgrounds.....	53	58		5	
Bureau of posts.....	54	58		4	
Civil affairs and customs.....	14	14			
Fire protection.....	42	43		1	
Police and prisons.....	139	139			
Magistrates' courts.....	5	4	1		
Schools.....	126	126			
Collector.....	13	13			
Paymaster.....	11	11			
Fortifications.....	10	7	3		
Health department.....	255	273		18	
Madden Dam division.....	68	22	46		
Marine division.....	181	181			
Mechanical division.....	384	437		53	
Supply department:					
Offices, chief quartermaster.....	10	9	1		
Constructing quartermaster.....	46	55		9	
District quartermasters.....	25	26		1	
Furn bureau.....	2	2			
Fuel-oil plant.....	35	33	2		
Storehouses.....	40	40			
Motor-car repair shop.....	26	28		2	
Motor transportation.....	36	40		4	
Panama Canal press.....	12	13		1	
Total, the Panama Canal.....	2,538	2,678	53	193	140
Panama Railroad Co.:					
General manager:					
Offices.....	22	22			
Railroad transportation.....	71	79		8	
Receiving and forwarding agency.....	81	89		8	
Supply department:					
Commissary division.....	201	203		2	
Hotels.....	12	13		1	
Dairy farm.....	2	3		1	
Total, Panama Railroad.....	389	409		20	20
Total force.....	2,927	3,087	53	213	160

Increases occurred in 23 of the 37 units of the organization and decreases in 5. The increase of 53 in the mechanical division was mostly of machinists and car repairmen resuming heavy repairs to freight cars; the increase of 28 in the locks division was due to the 40-hour week and necessary cleaning up of the Atlantic locks after overhaul. The increase in the electrical division was due to the 40-hour week and the bringing into operation of the new power plant at Madden Dam.

The increase of 15 in the municipal division was due to transfer of men previously employed by the Madden Dam division to work on the Dock 15 project and to the development of the new Gamboa town-site, while the health department's increase of 18 included a school physician, a nurse, a dental hygienist, dentists for silver clinics, relief physicians, an interne, an apprentice technician, a sanitary assistant, and 3 clerks.

Decreases were due to completion of projects and to the transfer of personnel to other divisions.

RECRUITING AND TURN-OVER OF FORCE

The following table shows additions to the gold force and separations from it in the fiscal year from July 1, 1934, to June 30, 1935. Employments are classified as made in the United States or on the Isthmus and separations are classified by cause. This table covers a slightly different period from that between the force reports of June 20, 1934, and June 5, 1935:

	Operation and maintenance	Executive	Supply	Health	Accounting	Panama R. R.	Total
Employed or reemployed in the United States.....	125	23	2	49	-----	3	207
Employed or reemployed on the Isthmus.....	252	42	65	22	8	57	446
Total additions.....	377	70	67	71	8	60	653
Resigned.....	43	31	4	31	1	15	125
Retired:							
Age.....	14	2	3	1	2	7	29
Disability.....	7	2	2	1	1	-----	13
Involuntary separation.....	1	-----	1	1	-----	-----	3
Voluntary separation.....	2	1	-----	-----	-----	-----	3
Died.....	5	4	1	2	1	2	15
Reduction of force.....	15	-----	1	-----	-----	-----	16
Expiration of temporary employment.....	168	7	46	13	-----	1	235
Discharged for cause.....	3	2	1	-----	-----	3	9
Adjudged insane.....	1	-----	-----	-----	-----	-----	1
Completion of apprenticeship.....	2	-----	-----	-----	-----	1	3
Total.....	261	49	59	49	5	29	452

The Panama Canal:		The Panama R. R. Co.:	
Additions.....	503	Additions.....	60
Separations.....	423	Separations.....	29
Net additions.....	170	Net additions.....	31

The number of employees retired during the year under the provisions of the Panama Canal Retirement Act was 48. Of these 13 were retired on account of disability, all of whom were Panama Canal employees; 29 were retired on account of age, 7 of whom were Panama Railroad employees. Voluntary separations numbered 3 and involuntary separations 3, all of whom were Panama Canal employees. Involuntary separations comprise those employees whom it was

necessary to discharge on account of reduction of force but who had sufficient service to entitle them to annuities.

The total number of gold employees added to the pay rolls on the Isthmus during the fiscal year by employment or reemployment is reported by the division of personnel administration as 653. Separations from the service numbered 452, making a net increase of 201. Based on a gold force of 2,934 as of June 20, 1934, the 452 separations give a turn-over rate of 15.4 percent from all causes. For the fiscal year 1934 the rate was 19.7 percent.

The number of persons tendered employment through the Washington office of the Panama Canal, all above the grade of laborer, was 392 as against 116 tendered the previous year. Two hundred and thirty-two persons accepted tenders and were appointed, covering 37 different classes of positions. Two thousand five hundred and thirty-nine persons (2,281 from New York, 140 from New Orleans, 18 from other Atlantic coast ports, 98 from Pacific coast ports, and two via air transport service), including new appointees, employees returning from leaves of absence and members of their families, were provided transportation from the United States to the Isthmus. This is an increase of 120 over the previous year.

SILVER EMPLOYEES

The numbers of employees on the silver roll by departments or divisions on the last force reports, June 1934 and June 1935, are shown in the following tabulation. The summary is for the days on which the force report is made, and the number of employees at work may change by several hundred within a short time, according to variations in the demand for labor. The summary shows only those actually at work on June 20, 1934, and June 5, 1935:

Department or division	Silver force		Decrease	Increase	Net increase
	June 20, 1934	June 5, 1935			
Panama Canal:					
Accounting department.....	5	3	2		
Dredging division.....	954	928	26		
Engineer of maintenance, assistant:					
Office engineer.....	3	4		1	
Surveys—meteorology.....	50	49	1		
Electrical division.....	190	212		22	
Locks division.....	635	650		15	
Municipal division.....	804	999		195	
Executive department:					
Executive offices.....	36	33	3		
Paymaster.....	2	2			
Clubs and playgrounds.....	145	234		89	
Bureau of posts.....	20	18	2		
Civil affairs and customs.....	1	1			
Police and prisons.....	44	44			
Magistrates' courts.....	2	2			
Schools.....	114	109	5		
Health department.....	770	839		69	
Madden Dam division.....	115	24	91		

¹ Total silver force employed on last force report day while all schools were in session.

Department or division	Silver force		Decrease	Increase	Net increase
	June 20, 1934	June 5, 1935			
Panama Canal—Continued.					
Marine division.....	548	563		15	
Mechanical division.....	783	794		11	
Supply department:					
Constructing quartermaster.....	532	503	29		
District quartermasters.....	325	345		20	
Farm bureau.....	21	22		1	
Fuel-oil plant.....	50	51		1	
Storehouses.....	240	249		9	
Motor-car repair shop.....	49	49			
Motor transportation.....	140	138	2		
Panama Canal press.....	76	73	3		
Total, the Panama Canal.....	6, 654	6, 938	164	448	284
Panama Railroad Co.:					
General manager:					
Offices.....	49	61		12	
Railroad transportation.....	273	251	22		
Receiving and forwarding agency.....	668	849		181	
Supply department:					
Commissary division.....	1, 001	1, 009		8	
Hotels.....	171	171			
Dairy farm.....	84	86		2	
Total, Panama Railroad.....	2, 246	2, 427	22	203	181
Total force.....	8, 900	9, 365	186	651	465

Increases were shown in 16 of the 37 units of the organization and decreases in 11. The decrease of 91 in the Madden Dam division as of June 5, 1935, was due to the transfer and discharge of personnel preparatory to the abolishment of the division on June 30, 1935. The increase of 22 men in the electrical division was due to increasing gangs for trans-Isthmian transmission line work and the temporary employment of an additional gang for protecting and repairing submarine cables for flood warnings needed for the Madden Dam project. The increase of 15 in the locks division was due to additional men employed for miscellaneous cleaning up of the Atlantic locks after overhaul. An increase of 195 in the municipal division was due to transfers from the Madden Dam division, repairs, and alterations to Madden Dam sluiceways, and work at the new Gamboa townsite. The bureau of clubs and playgrounds added 89 employees for work in the restaurants formerly operated under contract. The health department's increase of 69 was due largely to temporary work of cleaning up and repairing around the hospitals, while 12 were placed on the force of the new dental clinics.

WAGE DEPARTMENTS

GOLD EMPLOYEES

The Panama Canal Act provides that salaries or compensation for Panama Canal employees fixed thereunder by the President or by his

authority "shall in no instance exceed by more than 25 percent the salary or compensation paid for the same or similar services to persons employed by the Government in continental United States." It has been the policy generally to pay to United States citizens employed on the gold roll the full 25 percent above pay for similar work in the United States, within the limitations of appropriations and subject to the preservation of coordination within the organization, because of disadvantages inherent in the climatic and social conditions prevailing on the Isthmus.

With the beginning of the fiscal year, administrative promotions became permissible within the amount of savings in the appropriations and a number of promotions were made on and after August 1, 1934. The making of salary adjustments was suspended in January 1935 for all classes except for employees in a probationary status such as pilots, policemen, and lock operators, who were appointed provisionally at salaries below the authorized entrance rate of pay of their positions. It was provided that such employees might be advanced to the established entrance rate of pay of their positions after completion of a probationary period if their services were satisfactory and funds were available. Percentage deductions from pay were made as required by the economy act and Executive orders issued in accordance with such act, until April 1, 1935, when the full pay schedule was restored.

The wage board, consisting of the assistant engineer of maintenance and a representative selected by an organization of employees and approved by the Governor, held three meetings during the year in connection with rates of pay for officers on the crane boat *Atlas*; motormen, lock towing locomotives; and cargo foremen.

The salary board, composed of the heads of the nine major departments and divisions of the Panama Canal and Panama Railroad, held no meetings during the year.

The complaints board, established for the purpose of investigating and reporting on complaints of employees about working conditions, etc., referred to the board by the Governor, held no meetings during the year, as no cases were referred to it. All employees have the right of direct appeal to the Governor, irrespective of the board.

SILVER EMPLOYEES

Wages of employees on the silver roll, who are primarily natives of the Tropics, bear no definite relations to wages of corresponding classes of employees in the United States but are generally established at levels equal to or slightly above those prevailing for tropical labor in the Caribbean area.

Under Executive orders the maximum rate of compensation authorized for native employees is \$80 per month, or 40 cents per hour, with

the exception that these rates may be exceeded in the case of not more than 112 such employees possessing special qualifications. The basic hourly rate of compensation for common labor is 20 cents an hour. It has been at this level since 1922 with later provisos that 21 or 22 cents may be used as the entrance rate.

The rates of pay and other conditions of employment affecting silver employees are reported on by the Silver Wage Board, consisting of the heads of the major departments and divisions and the administrative heads of a few of the smaller organizations which employ a considerable native labor force. This board held no meetings during the year.

The average rates paid the native employees as of October 1, 1934, when the annual general survey was made, as compared with previous years, were as follows:

	Average rates			Average rates	
	Monthly employees (per month)	Hourly employees (per hour)		Monthly employees (per month)	Hourly employees (per hour)
Nov. 1, 1923.....	\$55.27	\$0.2312	Oct. 1, 1929.....	\$55.37	\$0.2450
Nov. 1, 1924.....	54.74	.2323	Oct. 1, 1930.....	57.09	.2560
Nov. 1, 1925.....	55.28	.2385	Oct. 1, 1931.....	57.46	.2460
Nov. 1, 1926.....	55.40	.2395	Oct. 1, 1932.....	54.34	.2400
Oct. 1, 1927.....	54.68	.2411	Oct. 1, 1933.....	56.95	1.2510
Oct. 1, 1928.....	56.44	.2496	Oct. 1, 1934.....	1 56.41	1.2500

¹ Prior to the economy act deductions.

The average rate per month, ignoring the economy act deductions and combining the monthly rates with the hourly on the basis of 208 hours per month, was \$54.38 for 9,458 positions, as compared with a similar figure of \$54.67 for 9,552 positions the preceding year; a decrease of \$0.29 per month. Reducing the \$54.38 per month by 5 percent, or \$2.72, results in \$51.66 per month, which was the average wage paid immediately prior to the abolishment of percentage reductions in pay. As with the gold employees, economy act deductions were abolished effective April 1, 1935.

The average rates of pay shown above were ascertained by making periodically a compilation and classification covering the rates of pay of all native employees in the service. The figures shown above do not represent average earnings but the average rates of pay at which these employees were carried on our time rolls. Average yearly earnings will fall somewhat below the annual equivalents of the average monthly and hourly rates shown above. The reason is that these employees do not receive any leave of absence with pay, excepting sick leave, and, consequently, any absences from duty not covered

by a physician's certificate, are without pay. Moreover, a considerable number of them are employed on construction projects, and on such work as loading and unloading cargo from ships, etc., where employment demands fluctuate greatly; the result is that the average number of hours worked by many of these employees falls greatly below 208 monthly.

As a further aid in maintaining an equitable scale of rates of pay and maintaining the standard of living of these employees, a weighted price index, reflecting price changes in the commissaries on more than 100 staple items in common use among these workers, has been carried forward for a number of years. With 100 adopted as an index figure reflecting commissary prices in 1914, the index rose to a peak of 168.98 in 1921, but has since declined gradually until the 1935 index figure was 114.04.

SUPERANNUATED NATIVE EMPLOYEES

The Panama Railroad Co., through the board of directors, has established a provision that native or tropical employees who are no longer able to perform useful service in any capacity may be removed from the active rolls and granted a small annuity or given a lump-sum payment. Since June 1, 1928, 21 such employees have been given lump-sum payments ranging from \$25 to \$500, and 221 employees have been granted pensions ranging from \$7 to \$25 per month. Since 1928, 51 pensioners have died, been transferred to Corozal Hospital, disappeared, or otherwise become separated from the pension roll, leaving 170 employees receiving annuities at the end of the fiscal year. As of June 30, 1935, the average payment was \$11.79 per month. The following table shows the number of those retired, the number of those granted monthly and lump-sum payments, and the number still receiving monthly payments at the end of the year:

Fiscal year	Lump-sum payments	Monthly payments	Total employees retired	Died in year indicated								Still living out of year's superannuates
				1928	1929	1930	1931	1932	1933	1934	1935	
1928		1	1									1
1929												
1930	7	26	33			2	5	1		6		12
1931	2	13	15				3	2				8
1932	2	24	26					2	1	2	3	16
1933	3	67	70						1	6	6	54
1934	5	60	65							5	4	51
1935	2	30	32								2	28
Total	21	221	242			2	8	5	2	19	15	170

The foregoing applies only to those superannuated native employees who have been in the service of the Panama Railroad Co. There is no provision for the payment of similar disability allowances to super-

annuated native employees of the Panama Canal, and such provision is needed in order to improve the service. At present the only provision is that these employees may be given domiciliary care in connection with the hospital for the insane at Corozal. Few of the employees are willing to stay there, and the facilities available do not allow taking care of their dependents or of any considerable number of former employees. The cost of such institutional care, per capita, exceeds that which would be necessary to provide a small pension and allow these incapacitated employees to live among their own people in the native environment. Legislation to make possible the necessary adjustments is outlined and explained further under "Administrative problems."

LEARNERSHIP COMMITTEE

A system of apprenticeship training in the skilled crafts was inaugurated on the Panama Canal during 1906, and from that time up to 1915 apprenticeship training was given only by the mechanics in the shops. During 1915 the training system was revised to provide part-time classroom instruction by the division of schools. During 1921, apprentice training was discontinued due to lack of funds and was not resumed again until 1923, at which later date the division of schools withdrew its support. From 1923 to August 1935, the mechanical division furnished classroom instruction for all apprentices as well as shop training for its own apprentices. Under the restrictions of the economy legislation, practically no new apprentices were employed during the fiscal years 1933 to 1935, inclusive.

Prior to resumption of the apprenticeships in the skilled crafts, it was decided to investigate thoroughly all matters pertaining to apprenticeships with a view of revising the past policy to meet more satisfactorily the needs of the Panama Canal. The Governor appointed a committee in January 1935, directing them to determine the scope of the apprentice system; ascertain the number and class of apprenticeships; make a comprehensive study of the requirements which should be adopted with respect to age; manner of selection of apprentices; rates of pay; the extent to which the division of schools could be utilized in apprentice training; and the extent to which shop experience could be provided for students in the junior college.

The committee's studies in connection with apprenticeship training in the skilled crafts developed the fact that there was a need also for providing training which would equip young men and women to fill positions outside of the skilled-craft groups. Accordingly, in May 1935, the Governor informed the committee that they were to give consideration to the practical preparation of local young Americans as replacements in all classes of positions in which the committee considered satisfactory training courses could be established which

would qualify young people for permanent employment in the organization.

At the close of the year the committee had practically completed its report and recommendations on apprenticeship training in the skilled crafts and had begun consideration of learnership courses for various classes of positions outside the skilled trades.

PUBLIC AMUSEMENT AND RECREATION

Operation of the Canal clubhouses, with their related activities of playgrounds, kindergartens, athletic fields, swimming pools, etc., continued as in the past years, but with a greater proportion of the expense borne by the receipts from charges for admission and service. As private industry is not permitted within the Canal Zone, the supplying and supervising of recreational facilities for the Canal employees and their families is a function of the Canal organization.

The clubhouses operated in the year were as follows: Gold clubhouses at Ancon, Balboa, Pedro Miguel, Gatun, and Cristobal; a boathouse near the quarantine station, and a bathhouse and refreshment stand at Farfan Beach; playgrounds at Ancon, Balboa, Pedro Miguel, Gatun, and New Cristobal; clubhouses for silver employees were operated at La Boca, Red Tank, Paraiso, Gatun, and Cristobal; a clubroom at Gamboa; playgrounds at La Boca, Red Tank, Paraiso, Gatun, Camp Bierd, and Mount Hope, and a bathing beach for silver employees near Farfan Beach. A gold and a silver clubhouse were operated at Madden Dam during part of the year. All clubhouses are open daily from 16 to 19 hours, including Sundays and holidays.

The Ancon restaurant building, which was taken over by this bureau in May 1934, will be opened at the new Ancon clubhouse early in the new fiscal year. The Balboa Heights lunch room and cigar stand were combined during the year as one unit. A cold-storage room is being constructed at the Balboa clubhouse restaurant to take care of cold-storage products and vegetables. The restaurant business at the Gatun clubhouse was the biggest for many years due to the overhaul of the Atlantic Locks. During the year, prices were increased as follows: Lunch from 35 cents to 40 cents; dinner from 50 cents to 60 cents. Receipts from the restaurant business comprised about one-half of the bureau's gross business revenues for the year. The receipts for the 12 months were \$327,550.52, and at the close of business on June 30 the restaurants showed a profit of \$779.89. The meals furnished are apparently giving satisfaction, as very few complaints have been made on account of the quality or quantity of food served. Considerable expense was incurred in connection with the operation of Balboa restaurant due to repairs to and the replacing of old equipment. The restaurants induced more people to come into the buildings, which increased the business in other activities, such as picture shows, etc.

Tennis was given special attention during the past year due to increasing interest in the sport. Classes were formed and intercourt competition and tournaments between towns were sponsored. Instruction was given to high-school pupils and matches were arranged and supervised after school hours and on Saturdays.

The new townsite at Gatun is being completed and in the near future it will be necessary either to move the old clubhouse or to erect a new clubhouse. The present clubhouse is 26 years old and is in poor condition.

New clubhouse buildings are needed also at Balboa and La Boca, as well as clubhouse and restaurant equipment, and equipment for all the playgrounds. The restaurant building at Cristobal will soon be converted into a clubhouse to replace the old building, which has been in use since 1907.

ADMINISTRATIVE PROBLEMS

One of the major duties of the Governor and his assistants is planning improvements, both in present administration and facilities and in provision for future needs. Brief discussion on some of the more important matters affecting operations are presented herewith.

LEGISLATIVE RECOMMENDATIONS

The need for legislation providing appropriations for replacements and extension of plant and equipment is explained elsewhere. A general review of pending legislation relating specifically to the Canal enterprise and to the Canal Zone follows:

Superannuation disability pay for native employees.—The proposed legislation would authorize the Governor, under regulations to be prescribed by the President, to pay cash relief to such native or tropical employees of the Panama Canal as may become unfit for further useful service by reason of mental or physical disability resulting from age or disease. As formulated in H. R. 4991, now pending in the House, the proposed legislation provides that such cash relief should not exceed \$1 per month for each year of service of the employee concerned, with a maximum payment of \$25 per month. To be entitled to superannuation relief, the employee would be required to have at least 10 years of service with the Panama Canal or Panama Railroad Co. on the Isthmus of Panama.

Measurement of vessels for Canal tolls.—There are now pending in Congress identical bills, H. R. 5292 and S. 2288, providing for the measurement of vessels using the Panama Canal. The form of the pending bills was determined after extensive studies of the problems

involved. The substantive portion of the proposed legislation is in the following form:

Tolls on merchant vessels, Army and Navy transports, colliers, hospital ships, supply ships, and yachts shall be based on net vessel-tons of 100 cubic feet each of actual earning capacity, determined in accordance with the "Rules for the Measurement of Vessels for the Panama Canal" prescribed by proclamation of the President, November 21, 1913, and as may be amended from time to time by order of the President, and shall not exceed \$1 per net vessel-ton so determined, nor be less than 60 cents per net vessel-ton so determined, on laden vessels, and on vessels in ballast without passengers or cargo shall be less than the rate of tolls for vessels with passengers or cargo: *Provided*, That tolls shall not be levied on a deck load, which is defined, for the purpose of this act, as cargo situated in a space which is at all times exposed to the weather and the sea and which space is not included in the net tonnage determined under the said "Rules for the Measurement of Vessels for the Panama Canal", except on tonnage of such deck loads which is in excess of 20 percent of the net tonnage of a vessel so determined.

Section 2 of the pending bills authorizes the President to appoint a special committee for the purpose of making a study and investigation of the rules for the measurement of vessels using the Panama Canal and the tolls that should be charged therefor and holding hearings thereon at which interested parties shall have full opportunity to present their views. It is provided that the committee so appointed shall report to the President prior to January 1, 1936, and shall make such advisory recommendations and modifications of the "Rules for the Measurement of Vessels for the Panama Canal" as they find necessary or desirable to provide a practical, just, and equitable system of measuring such vessels and levying such tolls. The proposed act would take effect September 1, 1936. The need for this legislation is fully discussed later in this section under "Tolls—Dual-measurement system" on page 99.

Amendments to Canal Zone code.—There was introduced in the first session of the Seventy-fourth Congress a bill, H. R. 6719, which provides some 14 amendments to the Canal Zone Code enacted June 19, 1934. The general purpose of the proposed amendments is to remedy certain minor defects which have been discovered in the code since its adoption and to make applicable to the Canal Zone certain portions of general legislation enacted for the United States since the enactment of the code. At the close of the fiscal year the bill had been reported to the House and passed and was pending before the Senate Committee on Interoceanic Canals.

Miscellaneous legislation.—Other legislation relating particularly to the Canal enterprise or the Canal Zone was pending in Congress at the end of the year. Senate Joint Resolution 36 authorizes an investigation of the means of increasing the capacity of the Panama Canal for future needs of interoceanic shipping, and for other purposes. During the first session of the Seventy-fourth Congress a rule was adopted in the House whereby legislation relating to the Panama

Canal will be considered by the Committee on Merchant Marine and Fisheries instead of by the Committee on Interstate and Foreign Commerce, as formerly. Senate Resolution No. 122, agreed to on May 28, 1935, provides for an investigation of labor conditions in the Panama Canal Zone in connection with certain pending legislation. S. 1819, H. R. 2745, and H. R. 5590, all introduced during the first session of the Seventy-fourth Congress, and on which no action had been taken at the end of the fiscal year, provide for the extensive replacement of native artisans, helpers, and employees in the lower grades by citizens of the United States. These latter bills have been the subject of exhaustive studies by the Canal administration and, for reasons which have been reported at length to Congress, their enactment has been vigorously opposed. Identical bills authorizing the enactment of a suitable statue of Maj. Gen. George W. Goethals, former chief engineer of the Isthmian Canal Commission and first Governor of the Panama Canal, commemorating General Goethals' great service in constructing and successfully completing the Panama Canal were pending in both Houses of Congress at the end of the fiscal year.

DISCUSSION OF PROPOSED LEGISLATION

SUPERANNUATION DISABILITY PAY FOR NATIVE EMPLOYEES

American citizens employed by the Panama Canal or Panama Railroad Co. are subject to retirement under the Panama Canal retirement law, but this provision applies only to American citizens. A large proportion of the Canal and Railroad force are natives of Panama or of countries adjacent to the Caribbean Sea, and they are without benefit of legal provision for retirement when, through superannuation or other disability, they can no longer perform their work. The Panama Railroad Co. can and does give to such of its native employees pensions ranging from \$7 to \$25 per month, but there is no authority to do this with native employees of the Panama Canal. All that can be done for them is to offer them care at Corozal Hospital, where there are no accommodations for their families, or to continue to carry them on the rolls at reduced rates of pay. The average earnings of the able-bodied native workers employed by the Canal approximates \$55 per month at the present time. During the construction of the Canal many of these native workers were employed at the rate of 10 cents an hour. Some of them have been employed by the Canal for 25 or 30 years and a number of them should now be replaced by younger men. Efforts have been made to employ them on light work at rates of pay ranging from \$15 to \$35 per month. It would be more economical to grant them a small annuity and move them away from the Isthmus.

The cost of caring for these employees, on the basis of an average pension of \$20 per month, has been estimated at about \$12,000 for the

first year, with a gradual increase to a maximum of \$121,000 a year for the twentieth year and each year thereafter.

The cost is not high considering the number of employees concerned, and the relief recommended is considered not only humane but a step toward more efficient operation through weeding out those who are no longer capable of service and then requiring of everyone on the active roll the normal daily performance of service.

REPATRIATION OF UNEMPLOYED ALIENS

The growth of the population of West Indian Negroes in the vicinity of the Canal has been in excess of the need of labor, and there is chronic unemployment among both West Indians and natives of Panama. Partial relief has been sought through repatriating some of the West Indians and their families, and the Republic of Panama has requested that the United States "proceed with the repatriation of unemployed foreign workers who have collected in the cities of Panama and Colon because of being left without work in the Canal Zone."

As these aliens are residents in territory of Panama, the participation of the United States in the movement consists in paying expenses of repatriation. The presence on the Isthmus of many of the aliens is due to their having come to seek work on the Canal as well as in the nearby cities in Panama. The United States has brought no contract laborers to the Isthmus since 1913 and has regularly offered repatriation to its discharged laborers who came to the Isthmus either under contract or on their own account. It has also taken the initiative in discouraging further immigration and requesting Panama to restrict it. However, it is recognized that the existing surplus of alien West Indian population in the two terminal cities is detrimental to the interests of Panama and to the relations between that country and the United States, and that it is to the joint interest of the two Governments to apply to the situation such remedies as are advisable and practicable.

A sum of \$150,000 was provided by Congressional appropriation toward the close of the fiscal year 1934 for the repatriation of unemployed West Indians and their families who have rendered at least 3 years' service with the United States Government or the Panama Railroad Co. In addition, upon repatriation, allowances of \$25 for single men and \$50 for men with families, who may also be allowed \$10 for each minor child, are granted in meritorious cases, with the limitation that the total amount allotted to an employee shall not exceed \$100.

During the past year approximately \$28,000 of this fund was expended on the repatriation and rehabilitation of 358 alien former employees accompanied by 413 members of their families. In the

latter part of the year the repatriation movement fell off, due in a large measure to various construction projects in progress on the Isthmus or proposed. The persons repatriated are for the most part older people whose usefulness is practically ended.

The Canal will continue to offer the opportunity of repatriation and a sum for rehabilitation in their home country to former employees while the fund lasts. This may relieve somewhat the unemployment situation in the vicinity but will have little permanent effect under present conditions, because of the relatively high birth rates among the tropical inhabitants.

TOLLS—DUAL MEASUREMENT SYSTEM

The legislation recommended with respect to tolls aims to establish the measurement of vessels and the collection of tolls on the single and uniform basis of the rules of measurement prescribed for the Panama Canal and to remove the variable factor of measurement according to national registry rules. The present system of measurement, having no equity among the several types of ships, may be considered as a form of subsidy to certain types at the expense of other types. Such an indirect subsidy to certain types of American vessels is unsound and in addition is necessarily shared by similar types of foreign vessels. For many years the Panama Canal has sought legislation to accomplish certain well-defined results, beneficial not only to shipping interests but to the United States, the objects being: First, to reestablish in the present law the system originally intended by Congress which through certain technicalities has become ineffective—a system patterned after that in general use for ship canals which have operated successfully over a period of many years and which is designed to avoid the very inequalities which the Panama Canal is now experiencing; second, to abolish the unsatisfactory, unfair, dual system of measurement whereby tolls charges are based on one tonnage and the limiting factor on another different and smaller tonnage subject to manipulation; third, to regain control over the tolls charged and to stop further endless reduction in tolls paid.

The legislation recommended by the Canal administration has been opposed by American steamship owners because it is expected to cause an increase in tolls charges on some of their ships. The Secretary of War indicated that he would recommend to the President after the enactment of the legislation with the proposed maximum rate of \$1 per ton, that he establish a tolls rate on laden vessels of not more than 90 cents. This rate on the 1933 traffic would have produced approximately the same aggregate total revenue as was collected in 1933 under the existing dual system of measurement. He stated further he would direct that a study be made of the Panama Canal rules

for the purpose of changing them so as to secure more equitable treatment for all vessels. In comment, the Secretary of War stated that the passage of the bill is essential to remove the existing inequalities in the treatment of shipping now passing through the Panama Canal and to prevent further reduction in tolls charges by structural changes in vessels that reduce registered tonnages but have practically no effect on the cargo-carrying capacity of vessels.

During the second session of the Seventy-Third Congress, the remedial legislation desired was passed by the House of Representatives but Congress adjourned before the bill was reached on the Senate calendar. During the first session of the Seventy-Fourth Congress, hearings have been held by the House Committee on Interstate and Foreign Commerce and joint hearings by the Senate Committee on Interoceanic Canals and a subcommittee of the Committee of Commerce. The identical bills, S. 2288 and H. R. 5292, have been favorably reported to the Senate and to the House but at the close of the fiscal year had not been brought to a vote.

The present toll-measurement system is irregular with respect to charges actually collected, is out of line with good administration in allowing charges to be determined by an agency not specifically responsible for such function, and is inequitable in its application to the ships using the Canal. Under it some ships pay the same amount for transit when heavily laden as when in ballast, with neither passengers nor cargo. On ships of approximately equal earning capacity, as measured by interior spaces which may be devoted to the carrying of cargo and passengers, one may pay tolls which are proportionally 50 percent higher than charges on the other. The charges on vessels in ballast are disproportionally high; they must now pay 72 cents per net ton, Canal measurement, unless such amount would be greater than \$1.25 times the net tonnage as measured under United States registry rules, and as a class they pay about 84 percent as much as they would for transit fully laden, although the intent of Congress in the original tolls legislation was that vessels in ballast should pay no more than 60 percent of the rate for laden vessels.

The inequity and even the absurdities of the present system have been clearly recognized and generally admitted. The opposition to adoption of the scientific Canal basis rests wholly on the question of increased costs to ships. The Panama Canal rules of measurement, having been devised after extensive study to determine the earning capacity precisely and fairly for the various types of ships, provide such a reliable and equitable method, subject to some amendment in line with ship development. These rules are essentially like the Suez Canal rules and their fitness for the purpose for which devised has never been questioned.

Genesis of rules.—The authority for levying tolls is found in the Panama Canal Act of August 24, 1912, as amended. It contains general provisions for the levying of tolls and authorizes the President to establish rules for measurement of vessels and rates of tolls within the limitations set by the act. The act provided that—

Tolls may be based upon gross or net registered tonnage, displacement tonnage, or otherwise * * *; may be lower upon vessels in ballast than upon vessels carrying passengers or cargo * * *; when based upon net registered tonnage for ships of commerce the tolls shall not exceed \$1.25 per net registered ton nor be less than 75 cents per net registered ton;

And—

if the tolls shall not be based upon net registered tonnage they shall not exceed the equivalent of \$1.25 per net registered ton as nearly as the same may be determined, nor be less than the equivalent of 75 cents per net registered ton.

Pursuant to the authority vested in him by Congress, the President issued a proclamation under date of November 13, 1912, which established rates on commercial ships as follows:

1. On merchant vessels carrying passengers or cargo, \$1.20 per net vessel ton—each 100 cubic feet—of actual earning capacity.
2. On vessels in ballast without passengers or cargo, 40 percent less than the rate of tolls for vessels with passengers or cargo.

The determination of the “net vessel-ton” or “net tonnage” on which the charges as above were to be levied was established by the Panama Canal rules of measurement, promulgated by a proclamation of the President, dated November 21, 1913, and put into effect immediately upon the opening of the Canal to commercial traffic.

Subsequently, upon a protest of certain shipowners regarding charges on deck cargo, the question of the interpretation of the act of Congress regarding tolls charges was referred to the Attorney General for decision. He decided that the term “net registered tonnage” as used in the act must be interpreted to mean the net tonnage of a vessel as measured under the rules prescribed by the statutes of the United States. There is nothing to indicate that the Congress intended to enact legislation which would be so interpreted.

Inasmuch as the act provided that the tolls charges should not exceed \$1.25 per net registered ton nor be less than 75 cents per net registered ton, the President ordered, in view of the decision by the Attorney General, that rules and regulations be issued with respect to the tolls “so that no tolls shall be demanded or collected upon any vessel of commerce which shall aggregate more than \$1.25 upon the net registered tonnage as measured under the statutes of the United States”, and so drawn “as to produce a similar result

with respect to the minimum that may be charged." It was anticipated by all concerned that the Congress would pass remedial legislation dealing with the subject more completely and satisfactorily, "but", to quote from the letter of the President, "until that course is taken, the way herein suggested seems to me to be the best one to meet the existing situation."

Result of rules.—Net tonnage as measured for national registry is universally lower than the tonnage as measured in units of 100 cubic feet of actual earning capacity (which is the Canal basis), and it is the practice of nations to keep registered tonnage of their ships down so as to reduce the light dues and port charges based on it. This practice is generally recognized and accepted, much like appraising property for taxation at figures lower than the real worth. As the port charges may be a few cents per net ton, in any event a relatively low figure, the figure for number of tons on which they are levied is not of great importance; also, the rate of port charges can be adjusted upward giving consideration to the depressed tonnage. But the net tonnage becomes important when it comes to a matter of a charge approximating \$1 per ton for transit through the Canal.

Since the "United States net" is in nearly all cases considerably lower than the "Panama Canal net" the practical result is that tolls on laden ships are collected on the basis of \$1.25 times the United States equivalent net tonnage. This would not be objectionable if the use of United States net tonnage resulted in equitable charges in proportion to the capacity of the ship. However, they were not devised to determine such capacity and are changed from time to time (usually so as to decrease the net tonnage by increasing the exemptions from inclusion in net tonnage) and the changes often are illogical and result in inequities among ships when used for toll charges. It is to be noted that while the purpose of the Canal rules of measurement is to include all space used for earning revenue, except deck space, national registry measurement aims often at excluding such spaces from net tonnage. The one system is directed toward justice, the other frequently toward privilege.

On ships transiting the Canal in ballast, the rate of 72 cents times the Panama Canal net prevails, except that the amount so derived may not exceed \$1.25 times the United States net. Due to these conflicting limitations, many ships with relatively low net tonnage, as measured under United States rules, pay the same amount for transit when laden as when in ballast. Ballast ships as a class pay considerably more than the amount which is "40 percent less" than the charge for like ships when laden.

The heavier charges on ballast ships caused by the existing rules are one element in the interference with levying equitable charges.

Assuming that they should not pay over 60 percent of the amount paid when laden, which was accepted as proper when the Canal rules were made, they are now being heavily overcharged as compared with laden vessels.

Difficulties and inequities occur also in levying tolls on laden ships under the dual system, due to the uncertainty and variability of the net tonnage as measured under registry rules. Examples are in the rules concerning shelter-deck spaces, passenger cabins, tonnage openings, scuppers, freeing ports, bulkheads, etc., in which some change of ruling in connection with United States measurement may arbitrarily affect the inclusion or exemption of spaces, without relation to the actual value and use of such spaces for carrying cargo. The technical details have been explained in separate reports; the essential point is that the situation results in uncertainty on the part of both the Canal and its users as to the important matter of tolls charges, and such charges are determined to a large extent by the orders and interpretations of an unrelated agency which is concerned with other matters than the justice of Canal tolls.

In individual instances the inequities resulting from application of the United States registry rules may affect a ship or fleet unfairly. Naturally the advantages gained by one group are reflected as disadvantages to its competitors. As applied to traffic as a whole, the factor of the United States rules results in reducing Canal tolls.

Reduction of revenues.—The reduction of revenues from tolls on laden ships occurs because it is possible to reduce the United States registry measurement without reducing correspondingly the earning capacity of the ship; and, as the United States equivalent net tonnage is reduced, the tolls collectible, limited to \$1.25 per net ton, so determined, are reduced correspondingly. In the fiscal year 1917, the first for which record has been kept of the aggregate United States equivalent net tonnage of vessels transiting the Canal, such tonnage for the 1,738¹ ocean-going commercial transits totaled 4,695,739 tons. The net tonnage for the same vessels as measured under the Panama Canal rules totaled 5,791,236 tons. The United States equivalent net tonnage was accordingly 81.08 percent of the Panama Canal measurement. In such proportion, if we assume a vessel of 10,000 net tons, Canal measurement, the United States registry net would be 8,108 tons; or, to draw nearer to practical comparisons with average actual ships, a ship of 5,000 net tons, Canal measurement, would be of 4,054 tons as measured under registry rules. On the original Panama Canal basis, tolls for the transit of a 5,000 net ton ship would

¹ This, and a number of subsequent figures in this paragraph, differ slightly from the figures shown in the 1934 annual report due to elimination from Panama Canal statistics of small commercial vessels of less than 300 tons.

have been \$1.20 times the net tonnage, or \$6,000. With the limitation that the tolls may not exceed \$1.25 times the registry tonnage as determined under United States rules, the tolls collected would be \$1.25 times 4,054, or \$5,067.50. The tolls were, therefore, reduced by \$932.50 and amounted to slightly over \$1 per Panama Canal net ton.

In the course of the effort to have the Panama Canal rules adopted as the sole basis of measurement, the Canal administration has proposed that a maximum rate of 90 cents per Canal net ton be established for laden ships. On such basis the laden ship of 5,000 net tons would pay \$4,500. In the ratio of Canal net to registry net in 1917 this would have been approximately \$500 less than the equivalent of \$1.25 times the United States registry net measurement.

Through the years since 1917 the net tonnage, as measured under United States registry rules has been reduced by virtue of various rulings of the Commissioner of Navigation (now the Director of Navigation and Steamboat Inspection), and by changes in ships' structure to take advantage of the rulings, but the Panama Canal net measurement, which determines interior carrying capacity, has not decreased. The percentage which the aggregate United States registry measurement net tonnage has formed of the Panama Canal net tonnage of transiting vessels in the fiscal years from 1917 to 1935, inclusive, is as follows:

Fiscal year	Percentage	Fiscal year	Percentage
1917.....	1 81.08	1927.....	1 78.40
1918.....	82.74	1928.....	77.60
1919.....	84.78	1929.....	76.38
1920.....	82.95	1930.....	75.65
1921.....	81.86	1931.....	74.09
1922.....	80.59	1932.....	72.82
1923.....	80.44	1933.....	71.70
1924.....	80.14	1934.....	71.22
1925.....	79.31	1935.....	69.87
1926.....	78.51		

¹ Percentage of this and subsequent years slightly changed from figures contained in 1934 annual report, due to the elimination from Panama Canal traffic statistics of all vessels less than 300 net tons.

Reverting to the 5,000-ton ship, measured under the Panama Canal rules, which have remained constant, in 1935 its net tonnage as measured under the United States registry rules would be only 3,494 tons, or 69.87 percent as great as its Panama Canal net tonnage. Tolls instead of being \$6,000, as originally intended, or \$4,500 on the proposed basis of 90 cents per Canal net ton, or \$5,067.50 on the basis of the United States registry measurement as in 1917, are \$1.25 times 3,494, or \$4,367.50. In other words, on this hypothetical representative ship the actual tolls charges under the dual system decreased by about \$700 between 1917 and 1935, or 13.8 percent, due simply to

changes and adjustments under the registry rules and not to any change in rates or in the earning capacity of the ship.

The above table of percentages indicates a continued downward trend. There is no definite limit to the decline under the present law. The revenues of the Canal are at the mercy of the officials who establish and interpret the rules for measurement for registry in the United States.

An analysis of the 1935 traffic through the Panama Canal reveals that of the 10 leading maritime nations utilizing the Panama Canal extensively during 1935 only three would have benefited more than the United States by the passage of the bill and the establishment of the 90-cent rate.

In the hearings on the Senate bill last year it was pointed out that Japan had not taken full advantage of the rules regarding exemption of cargo spaces on freight ships, but that they were beginning to do so. During 1934, the 84 Japanese vessels making 258 transits showed a United States net tonnage of 1,133,535 tons and a Panama Canal net of 1,413,305, the United States net forming 80.2 percent of the Panama Canal net. In 1935 there were 14 newly constructed Japanese vessels which arrived for the first time. These made 47 transits during the year. For the 47 transits the United States net tonnage of these newly constructed vessels, which had taken advantage of the exemption of cargo spaces allowed under the United States rules, amounted to 204,976 tons, while the Panama Canal tonnage was 292,349 tons, the United States tonnage thus amounting to only 70.1 percent of the Panama Canal net tonnage. As there were still some of the older Japanese vessels transiting the Canal, for the total traffic for the year the United States net was 75.8 percent of the Panama Canal net, or a reduction of 5.5 percent in tons and tolls charges from last year's (1934) figures. This will undoubtedly be lowered considerably more during 1936 as the older vessels are replaced or reconditioned to take advantage of the rules. This accounts in part at least for the substantial drop in the percentage for all vessels in 1935 as indicated in the table.

Remedy.—Insofar as the necessity of measuring vessels under two kinds of rules is concerned, this could be determined by action of the President, who might order that the tolls be levied on the basis of net tonnage as determined under the rules of measurement for registry in the United States. This, however, would make things worse by subjecting Canal tolls collection completely to the vagaries of the registry measurements. It would abandon entirely the scientific, equitable, and stable Canal measurement and substitute a system not specifically designed as a basis for levying tolls on total cargo-carrying capacity, variable according to minor conditions not

affecting capacity, and subject to changes in accordance with rulings of the Director of the Bureau of Navigation and Steamboat Inspection.

The remedy needed is to revert to the Panama Canal rules of measurement as a basis and to use them uniformly, applying such rates as may be prescribed by Congress and the President.

Equity of proposed tolls.—The maximum tolls on the basis proposed by the Panama Canal, of \$1 per Canal net ton for laden vessels, would be about 10 percent lower than Suez charges for laden ships on the old basis of exchange, and approximately 47 percent lower based on the rate of exchange, in effect at the end of the fiscal year. However, the law now proposed would allow the President discretion to adjust the rates between \$1 and \$0.60 per net ton, Panama Canal measurement, for laden vessels, the ballast rate to be less than the laden rate. It would extend to him the same discretion intended by the Panama Canal Act but would keep the tolls on the definite and equitable basis of the Canal rules of measurement, accurately and fairly related to earning capacity. The President might set the rate below \$1 per ton, as is justified in his judgment.

As previously indicated, the Secretary of War has stated that he will recommend a rate not in excess of 90 cents per Panama Canal net ton. This constitutes a reduction of 25 percent in the present rate on Panama Canal net tonnage. While the total tolls that would have been collected at rates of 90 cents laden and 54 cents ballast on Panama Canal net exceeds the tolls actually collected in 1935 by some \$430,000, it is desired to point out that the studies of the measurement rules to be made if the bill is enacted will include the advisability of exempting a part of the spaces in public rooms which have no direct earning capacity. A preliminary study indicates that there are approximately 300,000 tons of such space on all United States passenger vessels and 100,000 tons on foreign vessels transiting the Canal per year. If all such spaces are fully exempted, the tolls collected at these rates would be less than at present, and any vessels that would not secure a reduction in tolls charges by the adoption of the 90-cent rate must now be unduly benefitting at the expense of other vessels.

The principal accomplishment of the proposed legislation would be that an equitable and uniform basis would be in effect and the charges for transit through the Canal would be fairly related to the earning capacity of the ship, and the revenues of the Government from its service to shipping would be what the Government intends them to be.

Confronted with the adoption of the Canal basis only for tolls collection, some American steamship owners have proposed that the rate of 80 cents per Panama Canal net ton be adopted for laden ships and have also proposed as a general basis that no rate should be adopted

which would increase the charges on any American ship. The first proposal would set a rate too low, as judged by the service rendered to the ships, the cost of building and operating the Canal, and comparison with other canal rates and rates for land transportation. The second proposal seems completely unreasonable, not only because of the elements cited with respect to the first proposal but because it would demoralize tolls and revenues in order not to deprive a few ships of special benefits to which they are not in equity entitled. It would be a case of making great sacrifices to protect the beneficiaries of an abuse.

The justice of charging tolls at essentially the level of \$1, or 90 cents per ton for laden ships, is well established and is not opposed except by owners or organizations which desire individually to benefit through reduction of charges. In this connection it is sometimes claimed that a reduction in tolls rates would be an aid to American shipping. That this is a dangerous conclusion and one that cannot be substantiated is apparent. In the fiscal year 1935 tolls paid by foreign ships were 56 percent of the total tolls, those by the United States ships in the intercoastal trade 32 percent, and those by United States ships in foreign trade 12 percent. A lowering of Canal tolls below the value of the service rendered should be considered in the nature of a subsidy to shipping. The present administration is attempting to rid the Government of all such forms of concealed subsidies and to establish direct subsidies based on their own justification. Any such aid needed by passenger and general cargo ships will be taken care of presumably in the new direct subsidy. On the basis of the traffic in the past year each million dollars of tolls reduction would represent a subsidy of \$560,000 to foreign shipping, of \$120,000 to those ships of the United States which are in competition with foreign flags, and \$320,000 to United States shipping not in competition with foreign shipping. It is thus seen that, so far as United States shipping is concerned, the greatest reduction would be to vessels engaged in the intercoastal trade of the United States. These vessels are protected against the competition of foreign lines and their competition is with the land-transportation systems in the United States. Expenses of operation and maintenance of the Canal will increase on account of the necessity of replacements and betterments. It appears in line with sound business practice not to lower the rates of tolls below the present levels or approximately the proposed rates on the Canal measurement basis. On the contrary, it is essential to establish the levying of tolls on an equitable basis and to put an end to the situation by which the Government is being deprived of legitimate revenue at an ever-decreasing rate of tolls per net ton, Panama Canal measurement, through the workings of the dual measurement system.

In the meantime new ship-building programs are being rapidly pushed to completion, and foreign nations, by taking advantage of the present rules, are depriving the Panama Canal of income properly earned. Any desired change in income should be effected by a change in the rate per ton ordered by the President within the limits prescribed by Congress, rather than by arbitrary changes in the measurement of vessels. It is urgently recommended that the bills to "Provide for the measurement of vessels using the Panama Canal, and for other purposes" before the Senate and the House at the end of the fiscal year be enacted into law.

PUBLIC WORKS ALLOTMENT, 1935

At the beginning of the fiscal year 1935 there remained a sum of approximately \$150,000 of the special allotment of \$1,000,000 to the Panama Canal under the National Industrial Recovery Act. Authority was granted on December 1, 1935, by the Director of Federal Projects to transfer from the high school and junior college project to the amount apportioned for quarters for American employees the sum of \$13,000, increasing the latter from \$175,000 to \$188,000 and reducing the school and college project from \$300,000 to \$287,000. All allotments were expended except that for the high school and junior college, which at the close of the year had a balance of \$1,089.18, of which \$950 was obligated and the remaining \$139.18 was returned to the Treasury. The following table shows the status of all National Industrial Recovery Administration projects on June 30, 1935:

Project	Amount allotted	Expended to June 30, 1935	Deposited in Treasury	Unexpended balance
Dredging division station at Gamboa.....	\$50,000	\$50,000.00	-----	-----
1,000-cubic foot steel barge.....	100,000	100,000.00	-----	-----
Quarters for American employees.....	188,000	188,000.00	-----	-----
High school and junior college.....	287,000	285,910.82	\$139.18	\$950.
Dock 14, Cristobal.....	25,000	25,000.00	-----	-----
Dock 15, Cristobal.....	350,000	350,000.00	-----	-----
Total.....	1,000,000	993,910.82	139.18	950

CAPITAL ALLOTMENTS, FISCAL YEAR 1936

The appropriation for 1936 carried \$2,285,500 for replacement of worn-out or excessively deteriorated facilities, \$298,440 for continuation of Madden Dam construction, and \$253,800 for other betterments, to which has been added \$121,471 representing the net unexpended balance to cover uncompleted projects carried forward from

1935, making a total of \$2,959,211 available for capital expenditure in the fiscal year 1936, which has been allotted as follows:

Dredging division station, Gamboa (continuation).....	\$852,937
Quarters for American employees.....	447,902
Dock no. 15, Balboa (completion).....	500,000
Gaillard Highway through Corozal (relocation).....	45,188
Gaillard Highway, Paraiso to Summit (completion).....	16,442
Fort Randolph Road, rebuilding (continuation).....	68,500
Bolivar Highway, repair (continuation).....	56,435
Clubhouses, Ancon and Cristobal (relocation).....	100,000
Grading for building sites, Gatun (completion).....	76,248
Conversion of Balboa restaurant.....	70,096
Madden Dam (completion).....	412,064
Quarters for military guards (all locks).....	61,800
Ward building, Palo Seco leper colony.....	27,000
Storage building for overhaul equipment, Pacific locks.....	35,000
Metal block assemblies, Balboa drydock.....	50,000
Extension of sewer, Amador Road.....	30,000
Drydock crane (completion).....	20,874
Towing locomotive (completion).....	55,881
Fences, mechanical division.....	11,808
Electric lighting, Cristobal shops.....	11,450
Customs fence, Balboa.....	5,000
Miscellaneous minor items.....	4,586
Total.....	2,959,211

EXPLANATION OF FOREGOING ITEMS

Dredging division station, Gamboa.—The headquarters of the dredging division is at present located at Paraiso at the south end of Gaillard Cut about 8 miles from the Pacific terminus of the Canal. This establishment is to be removed to Gamboa at the junction of the Chagres River with Gatun Lake, which location provides a more ample roadstead for floating equipment, and lies on the lake side of the slide area in Gaillard Cut, thus affording direct access to unlimited dumping grounds. (This project is more fully discussed on p. 49.)

Quarters for American employees.—The amount allotted for 1936 and the sums to be requested in the succeeding years are urgently needed to continue the replacement of old and dilapidated frame buildings which were constructed either by the French Canal Co. or during the earliest days of American occupation of the Canal Zone. The program outlined by the Canal administration calls for \$500,000 for replacement of old quarters each year, although \$600,000 or \$700,000 annually would produce greater economy in the end. At \$500,000 per year it will take about 10 years to replace the present old quarters. (The need for replacing a number of the old quarters now in use is set forth in detail on pages 68 and 69.)

Dock No. 15, Balboa (completion).—This dock replaces old dock No. 15 which was constructed in 1911 to handle the west coast lumber shipments during Canal construction, as well as to form a part of the permanent system of wharves in the Pacific port. The replacement

has become necessary due to a gradual earth movement which has developed. This movement has cracked the majority of the caissons and weakened the dock to the extent that it was no longer considered safe for deck loads, and the mooring of vessels thereto was prohibited.

Gaillard Highway through Corozal.—The section to be relocated is a part of the main highway on the east side of and paralleling the Canal, which carries much traffic. It is very narrow and winding, and passes through the military post of Corozal where the local post traffic combines with the through traffic, thus creating a dangerous condition. The proposed relocation by-passes this section of the post of Corozal and will greatly improve traffic circulation.

Gaillard Highway, Paraiso to Summit.—The appropriation for this project provided for surfacing a mile and one-half stretch of macadam road extending from the end of the concrete pavement part way up Paraiso Hill to the junction with Madden Road near Summit. Practically all the work on this project was completed in 1935.

Fort Randolph Road, reconstruction.—The work on this project, a part of which was performed in 1935 and which will be completed in 1936, consists of rebuilding about 8,500 lineal feet of road. This road, which is subjected to heavy traffic, is the only highway connecting Fort Randolph, Coco Solo Fleet Air and Submarine Base, and France Field with Colon.

Bolivar Highway, repair.—Bolivar Highway is the main road connecting Gatun and Fort Davis with Mount Hope, Cristobal, and Colon, and runs for a considerable portion of its length on clay fills through a low, swampy area. The project consists of laying a new concrete slab over the old slab as a base.

Clubhouses, Ancon and Cristobal.—As a result of one of the concessions granted to Panama by the President of the United States in 1933, existing contracts with outside interests for the operation of restaurants were canceled effective in May of last year, and restaurant operations were taken over by the Panama Canal in order to enforce strict limitation of patronage to employee personnel. The expenditure involves the cost of consolidating the restaurants with clubhouse activities, and building an annex to the restaurant at Cristobal to house the assembly hall, moving picture, and other clubhouse activities.

Grading for building sites, etc., Gatun.—This involves the performance of considerable municipal work commenced last year in connection with the replacement of gold quarters in Gatun.

Conversion of Balboa restaurant.—This involves altering the concrete restaurant building in Balboa for use as a police station.

Quarters for Locks Military guards.—The proposed new quarters consists of elevated structures of frame construction and galvanized

roofs to replace present facilities consisting of screened frames with wooden floors, supporting standard army tents.

Ward building, Palo Seco leper colony.—The proposed new ward building is to be built as an additional unit to the existing facilities which are overcrowded.

Storage building for overhaul equipment, Pacific Locks.—This structure is to be built to provide storage space for overhaul material, tools, and spare parts.

Metal block assemblies, Balboa drydock.—These additional assemblies are to be provided for drydocking ships of the United States Navy.

Extension of sewer, Amador Road.—The extension of this sewer about 500 feet is necessary due to the offensive odors in the dry season emanating from the main outlet near cottages on the Amador Road.

Drydock crane.—This is to be used in Cristobal in connection with the work of the recently reconstructed and enlarged drydock. The increased capacity of the drydock makes this crane necessary.

Towing locomotive.—The addition of this towing locomotive will result in speeding transits of vessels through the Canal during periods of traffic congestion. This item was included in the 1934 report but work was not completed.

Fences, mechanical division.—Fences are considered necessary at the Cristobal and Balboa shops of the mechanical division to afford adequate protection for these areas.

Electric lighting, Cristobal shops.—It is considered necessary that street lighting be installed in the area of the Cristobal shops to facilitate police and fire protection.

Customs fence, Balboa.—This involves fencing the pier entrances. This is considered necessary in order to facilitate police supervision and to relieve vehicular congestion on the piers.

GENERAL PROGRAM

In anticipation of future needs, in 1931 the Canal administration prepared a program of work to be carried on during the next 10 or 15 years. The decrease in national revenues resulting from the general business depression led to some deviation from these original plans.

Recently, a 6-year program was submitted to the Federal Employment Stabilization Office of the Treasury Department, calling for a total capital expenditure of \$16,000,000 from 1937 to 1942. This program was carefully considered and represented the best thought and judgment that could be brought to bear on the future appropriation needs of the Canal organization.

The value of adopting and adhering to a definitely planned program of replacements and betterments lies in the fact that very appreciable

savings frequently can be effected in the purchase of materials, recruiting and employment of personnel, and in coordinating the program for replacements and betterments with the regular activities of the Canal organization.

ADDITIONAL NEEDS

As stated above, lists have been prepared of needed additions and replacements over a period of years and approximate estimates have been made of the costs. Obtaining funds for this work is one of the most important problems of the Panama Canal. For the construction of the Canal and its many auxiliaries, temporary, inexpensive wooden structures were built to house the shops and other parts of the construction plant, the employees and many of the public-utility and governmental functions, and many of these continued to be used in the interest of economy for housing the operating plant and personnel after construction was completed. Because of the destructive effects of the elements and of the insects in this locality, the economical life of such structures is relatively short. The plan is to replace these with structures of longer life, and at the same time increase their capacity where justified, as funds are obtained. The undertaking is so extensive that many of these old structures are being maintained at excessive cost, and this uneconomical procedure will continue and become progressively worse at an accelerated rate unless funds for the purpose can be made available for replacements during the next 5 or 10 years. The most economical method of effecting replacements would be to allocate a definite sum to be used for this purpose each year as this would permit coordinating the replacement program with the regular activities of the Canal organization.

UNEMPLOYMENT

An allotment of \$1,000,000 was made available in 1933 for public works relief under the Canal administration. Most of it was used in that year and during the past year the remainder was expended with the exception of \$1,089.18; of the latter amount \$950 was carried forward for expenditure in the fiscal year 1936 and \$139.18 was turned in to the Treasury.

Requests have been made for additional allotments of public works funds for use on much needed enlargements and betterments in the Canal plant, including the construction of additional quarters to be rented to the employees. Such projects, while they would relieve to some extent the local condition of chronic unemployment, have been formulated for the primary purpose of making needed improvements.

The Canal Zone and terminal cities of Panama and Colon are faced by a condition of permanent unemployment for both Americans and native workers. This is primarily because the natural increase

in population has been and is in excess of labor requirements and the adjacent country has not been so developed as to absorb extensive additions to population. For many years the Canal administration consistently offered repatriation to all persons who were brought to the Isthmus under labor contracts, and also to those who came on their own account if they had rendered considerable service. In June 1934 the repatriation policy was further liberalized and the Canal adopted the practice of repatriating any former employees who had worked three or more years for the Government of the United States, at any time, even though such persons came to the Isthmus of their own responsibility and notwithstanding efforts of the Canal administration to discourage such immigration.

Also there has developed in the American population especially, certain cases of widows and others who are beyond the age limits prescribed for Canal employment, or otherwise unsuited for such work. Efforts have been made to arrange with the National Emergency Relief Administration for the care of such of these people as are United States citizens upon their repatriation by the Canal to a seaport in the United States. It is considered that it is not practicable to carry on relief operations in the Canal Zone, which is essentially a Government reservation devoted to the operation and defense of the Canal, and it is better for such unemployable Americans to be returned to the United States.

At the end of the fiscal year there were on file approximately 500 applications from local American residents for employment and approximately 1,780 such applications on the part of Panamanians, West Indians, and others.

CAPACITY OF THE CANAL

A study of the capacity of the Panama Canal for passing ships between the oceans was summarized in the annual report for 1931. Observations of lockage capacity were continued during the past year and the essential conclusions remain unchanged; i. e., that an average of 26 commercial lockages per day represents capacity during locks' overhaul, and when this average is reached the third flight of locks should be available for use; and that at a possible average of 7,500 net tons per lockage, the present capacity of the Canal is about 70,000,000 or 75,000,000 Panama Canal net tons per year. This is approximately three times the tonnage which passed through the Canal during the fiscal year 1935. With a third flight of locks the Panama Canal could handle about five times the present traffic. The capacity of the Canal is ample for any traffic likely to develop in many years to come. At present our problem is an insufficiency of traffic rather than any probability of insufficiency of capacity, hours of operation, third set of locks, or other means of increasing the capacity.

**VISITS OF PRESIDENT ROOSEVELT AND SECRETARY OF WAR
DERN**

President Franklin D. Roosevelt arrived at Cristobal at 8:10 a. m., July 11, 1934, on board the cruiser *Houston* of the United States Navy. The President was met at Cristobal by the Governor of the Panama Canal. The President's ship was also boarded upon arrival by the Secretary of War, who had landed on the Isthmus in advance of the President. The *Houston*, with the President and his party aboard, began transit through the Canal at 10:05 a. m., the day of arrival, and docked at Balboa at 4:12 p. m.

At all locks the President was greeted by residents of the Canal Zone and Panama, and at the Gatun and Miraflores Locks military courtesies were rendered by Army forces from the corresponding sectors. At Balboa, the President received numerous visitors aboard and came ashore on three occasions for drives through parts of the Canal Zone and Panama. Visits were exchanged between President Roosevelt and President Harmodio Arias of the Republic of Panama.

The President continued his journey to Hawaii on July 12, the *Houston* clearing from the dock at 5:30 p. m.

Secretary of War George H. Dern, accompanied by his wife and daughter, by Mrs. Henry A. Wallace, wife of the Secretary of Agriculture, and by Majs. H. A. Bishop and W. R. Gruber, of the United States Army, arrived on the Isthmus on July 11, 1934. The Secretary remained on the Isthmus until July 25, acquainting himself with details pertaining to the operation and maintenance of the Canal, and of the forces of the Army stationed in the Zone. He left the Isthmus by airplane to go to Puerto Armuelles, Panama, and from there he proceeded to Los Angeles by commercial ship.

SECTION IV

GOVERNMENT

The civil government of the Canal Zone is conducted as prescribed in the Panama Canal Act of August 24, 1912, and other acts and Executive orders made applicable to the Canal Zone. Whenever it has been practicable to assign governmental functions to departments in the organization established for the operation and maintenance of the Canal, this has been done. Complete cooperation and greater economy and efficiency are derived from such coordination of functions.

Data on the expense and revenues of various features of the Canal operation and Government are shown in the financial and statistical statements in section V.

AREA OF THE CANAL ZONE

The total area of the Canal Zone and the areas segregated for various purposes, as of July 1, 1935, are shown herewith:

	<i>Square miles</i>
Total area of the Canal Zone.....	552. 80
Land area of Canal Zone.....	361. 86
Water area of Canal Zone (inclusive of Madden Lake to + 260-foot contour).....	190. 94
	————— 552. 80
Land areas: Military and naval reservations (inclusive of revocable-license areas):	
Military reservations.....	51. 33
Naval reservations.....	7. 12
	————— 58. 45
Land areas, Canal Zone town sites (exclusive of Army and Navy posts).....	11. 94
Barro Colorado Island.....	5. 71
Cemeteries.....	. 12
Forest reserve.....	5. 47
Swamps.....	16. 50
Farms, cattle pastures.....	77. 70
Usable land.....	185. 97

POPULATION

A house-to-house canvass of the civil population of the Canal Zone, including employees of the Army and members of families of Army and Navy personnel, but omitting commissioned, warrant, and en-

listed personnel, was made by the police force during the month of June 1935. A summary is presented below:

District	Americans			All others			Total
	Men	Women	Children	Men	Women	Children	
Balboa.....	2, 134	2, 275	2, 091	3, 578	2, 285	5, 492	17, 855
Cristobal.....	494	659	778	3, 197	1, 906	4, 620	11, 654
Prisoners.....	8			115	4		127
Total.....	2, 636	2, 934	2, 869	6, 890	4, 195	10, 112	29, 636

The foregoing total indicates a decrease of 328 as compared with the 29,964 population reported in June 1934. Corresponding figures for earlier years are: 1931, 30,745; 1932, 30,980; and 1933, 31,839.

Of the 29,636 civil population in June 1935, a total of 7,553 were employed by the Panama Canal and Panama Railroad Co.; of these, 2,587 were Americans and 4,966 were aliens. Approximately 500 American and 4,200 alien employees were living outside the Canal Zone.

PUBLIC HEALTH

General health conditions in the Canal Zone and in the two terminal cities of Panama and Colon continued good during the past year. No epidemics of diseases have occurred.

In July 1934, the members of the Army Medical Research Board arrived on the Isthmus, and since that time have been doing excellent work, especially on malaria, in cooperation with the Health Department. In December 1934, the Health Department opened a silver dental clinic at Gorgas Hospital, and in March 1935 opened a silver dental clinic at Colon Hospital. Formerly silver employees of the Panama Canal residing on the Canal Zone were mostly taken care of by dental technicians who lacked proper preparation for many classes of dental work.

VITAL STATISTICS

The morbidity and mortality rates from diseases and injuries and other vital statistics relating to the populations of the Canal Zone and the cities of Panama and Colon, are set forth in detail in the calendar-year report of the health department, which is published annually in pamphlet form. For this reason most of the tables are omitted from this report and the discussion of vital statistics is limited to a brief résumé of death rates, birth rates, and infant-mortality rates.

General death rate.—The death rate from all causes in 1934 for the population residing in the Canal Zone was 6.43 per 1,000 of the population, being the lowest of record; for Panama City the rate was

12.70 per 1,000; for Colon the rate was 14.83. The trend in death rates by 5-year periods for the past 20 years is shown in the following table:

Death rates per 1,000 of population—all causes

	1915-19	1920-24	1925-29	1930-34
Canal Zone.....	9.89	8.30	8.11	7.11
Panama City.....	25.62	19.80	18.43	15.75
Colon.....	24.26	15.30	14.67	15.80

Birth rates, including stillborn.—The birth rate for the population residing in the Canal Zone, for 1934, was 11.48 per 1,000 population; it has been declining continuously for some time, as is shown by the following tabulation covering 5-year periods:

	1920-24		1925-29		1930-34	
	White	Colored	White	Colored	White	Colored
Total birth rate per 1,000 population.....	16.69	29.01	11.60	20.18	8.84	14.65
Live birth rate per 1,000 population.....	16.15	27.41	11.20	18.84	8.61	13.75
Stillbirth rate per 1,000 population.....	.54	1.60	.40	1.34	.23	.90

The birth rate for Panama City was 31.66 per 1,000 population, as compared with 33.00 for 1933 and 32.32 for 1932. The birth rate for Colon was 30.53, as compared with 28.37 for 1933 and 30.77 for 1932.

Death rates among children under 1 year of age.—The following table shows the infant-mortality rates, by 5-year periods, from 1920 to 1934:

Deaths of infants under 1 year, per 1,000 births

	1920-24	1925-29	1930-34
Canal Zone:			
White.....	40	53	37
Colored.....	120	118	90
Combined.....	91	97	72
Panama.....	151	134	124
Colon.....	130	115	105

Principal causes of death.—The principal causes of death in each of the three groups of the population were as follows:

Number of deaths and annual rate per 1,000 population, 1934

	Canal Zone		Panama		Colon	
	Number	Rate per 1,000	Number	Rate per 1,000	Number	Rate per 1,000
Organic diseases of the heart.....	29	0.73	64	0.80	34	1.13
Diseases of the arteries.....	20	.50	40	.50	4	.13
Tuberculosis (various organs).....	19	.48	150	1.88	63	2.10
Cancer (various organs).....	17	.43	50	.63	29	.97
Pneumonia (broncho and lobar).....	10	.25	142	1.78	60	2.00
Nephritis (acute and chronic).....	9	.23	70	.88	25	.83
Apoplexy.....	6	.15	30	.38	20	.67
Diarrhea and enteritis, including colitis.....	1	.03	98	1.23	20	.67

MALARIA

The rate for malaria showed considerable improvement over that of the preceding year, as indicated in the following table:

Malaria rates per 1,000 employees during the past 10 calendar years

Year	Rate	Year	Rate
1925.....	27	1930.....	26
1926.....	14	1931.....	19
1927.....	11	1932.....	14
1928.....	14	1933.....	27
1929.....	21	1934.....	16

HOSPITALS AND DISPENSARIES

The number of patient-days in Panama Canal hospitals for the past 3-calendar years has been as follows:

	1932	1933	1934
Gorgas Hospital.....	149, 812	149, 292	136, 670
Corozal Hospital:			
Insane.....	253, 240	172, 413	61, 787
Cripples and chronic medical and surgical cases.....	31, 802	33, 696	39, 322
Colon Hospital.....	35, 379	31, 378	29, 875
Palo Seco leper colony.....	38, 543	34, 422	39, 185
Total.....	508, 776	421, 201	306, 839

The reduction in patient-days at Corozal Hospital was due to the transfer, in July 1933, of 600 insane patients undergoing treatment at the expense of the Republic of Panama to the new asylum operated by the Panamanian Government at Retiro Matias Hernandez. At Gorgas and Colon Hospitals the decline was due, in part, to the agreement between the President of the United States and the President of Panama, put into effect in October 1933, which provided that treatment in Panama Canal hospitals be limited to United States Government employees and their families, except in emergency.

SMALLPOX VACCINATION

The general vaccination of the population of the Canal Zone and the cities of Panama and Colon, which was begun in the fall of 1933, was finished in 1934, during which period 49,947 persons were vaccinated or revaccinated.

PHYSICAL EXAMINATION FOR SCHOOL CHILDREN

In January a full-time unit, consisting of 1 physician, 2 nurses, and 1 dental hygienist, was started for the physical examination of school children.

QUARANTINE AND IMMIGRATION SERVICE

Inspection was made of 6,348 vessels and 586 airplanes, as compared with 6,523 vessels and 497 airplanes during the preceding year; 171 vessels availed themselves of the "special demand" night boarding service, as compared with 134 last year.

During the year no vessel was held in quarantine, but 1,021 persons were detained for immigration purposes, and 727 persons were deported for violations of the immigration regulations.

With the permission of the Governor, the chief quarantine officer visited ports in Ecuador and Peru to inspect antiplague measures. The new port terminal facilities at Callao, Peru, were inspected and found to be ratproof.

The activities of the quarantine division during the fiscal year 1935 are summarized in the following table:

Vessels inspected and passed.....	6, 169
Vessels granted pratique by radio.....	179
Total.....	6, 348
Crew passed at quarantine.....	370, 691
Crew passed by radio.....	51, 896
Passengers passed at quarantine.....	145, 656
Passengers passed by radio.....	4, 986
Total.....	573, 229
Airplanes inspected and passed.....	586
Crew of airplanes inspected and passed.....	1, 913
Passengers of airplanes inspected and passed.....	2, 322
Total.....	4, 235
Vessels detained in quarantine.....	0
Crew detained on board ship for quarantine.....	0
Immigration cases admitted to station.....	1, 021
Number of detention days.....	5, 501
Persons held for investigation and released.....	127
Persons deported under immigration laws.....	727
Supplementary inspection of vessels.....	3, 674
Vessels fumigated.....	48
Box cars fumigated.....	291
Number of "special demand" night boardings.....	171

MUNICIPAL ENGINEERING

The municipal division has charge of the construction and maintenance of roads, streets, and sidewalks and the water and sewer systems in the Canal Zone. Furnishing of water and the maintenance

of the water and sewer systems and streets in the cities of Panama and Colon were also handled by the division. Construction work was performed for departments and divisions of the Panama Canal, the Army and Navy, and for individuals and companies.

The organization of the municipal division is divided into three main sections, viz, the southern district, including all points in the Canal Zone south of Gamboa and Panama City; the northern district, including all points in the Canal Zone north of Darien and Colon; and the section of water purification and laboratories, including operation of purification plants, laboratories, and reservoirs. In addition, two subdivisions were formed during the year, one at Gamboa, covering municipal work in connection with construction of Gamboa townsite, and the other at Madden Dam, covering repair and reconstruction of redesigned spillways and completion of clay grouting, grouting of the main dam, and miscellaneous other work in connection with the dam construction.

WATER SUPPLY

Consumption of water for municipal uses during the past 3 years has been as follows:

	1933	1934	1935
	<i>Gallons</i>	<i>Gallons</i>	<i>Gallons</i>
Canal Zone.....	3,334,065,110	3,040,224,000	3,054,712,300
City of Panama.....	1,485,666,000	1,400,882,000	1,498,282,000
City of Colon.....	759,279,000	745,340,000	800,360,000
Sales to vessels.....	155,756,390	169,787,000	174,095,700
Total.....	5,734,766,500	5,356,233,000	5,527,450,000

The following statement shows the quantity of water pumped at each of the pumping stations during the year, the average per month, and the cost of pumping per thousand gallons:

Pumping station	Total gallons pumped during year	Average gallons per month	Average cost per 1,000 gallons for pumping
Gamboa, U. S. no. 1.....	3,495,418,000	291,285,000	0.0221
Miraflores, U. S. no. 2.....	482,580,000	40,215,000	.0255
Balboa, U. S. no. 3.....	2,597,611,000	216,468,000	.0189
Paraiso.....	58,359,000	4,863,000	.0520
Mount Hope.....	1,802,763,000	150,230,250	.0226
Agua Clara.....	336,966,000	28,080,500	.0637
Monte Lirio.....	1,451,500	120,958	.8216
Frijoles.....	4,309,500	359,125	.2731
Total.....	8,779,458,000	731,621,833

The usual maintenance work was performed on pipe lines, reservoirs, filtration plants and pumping stations during the year. All pumps are electrically driven, except at Frijoles and Monte Lirio, which are

driven by gasoline engines. Monte Lirio and Frijoles also have auxiliary windmills, which operate whenever there is sufficient wind movement.

In addition to regular maintenance, work was performed on several special projects, as follows:

Overhaul and repair of pumps and motors, and repairs to pumping-station building, Mount Hope; repairing of water line damaged by flood erosion south of Miraflores Diesel plant; repairing of break in water line under Canal at Balboa; rearranging piping system for wash-water tanks and pumping station, Miraflores filtration plant; overhaul of Mount Hope filters.

SEWER SYSTEMS

Usual maintenance work was performed on the sewer system. In addition, the following special projects were carried out during the year:

Installation of new pumps, New Cristobal sewage pumping station; construction of culvert near Silver City commissary to improve drainage; extraordinary cleaning of sewer mains at Silver City; installation of additional storm sewers in vicinity of fire station and police station, Balboa, to relieve flood conditions during periods of heavy rainfall; replacement of vitrified pipe sewer on Prospect Street with cast-iron pipe sewer (necessary on account of roots of trees blocking sewer).

ROADS, STREETS, AND SIDEWALKS, CANAL ZONE

Usual maintenance work was performed on the roads, streets, and sidewalks, and in addition the following special projects were in progress during the year:

Reconstruction of Randolph Road.—A section of Fort Randolph Road extending from the entrance of France Field to the intersection of Diversion Road was rebuilt, and comprised the most important item of road construction in the northern district during the year. This new road, which is 8,213 feet in length, was built to conform to the latest standard specifications for highway construction and involved the excavation and placing of 9,000 cubic yards of earth, and the mixing and placing of 3,760 cubic yards of concrete.

Relocation and construction of Gaillard Highway.—A section of road was constructed during the year from Paraiso to the junction of Madden Road. The new road replaces an old oilbound macadam road, having extreme grades and a number of bad curves. The project consisted of constructing 9,000 feet of reenforced concrete slab, 18 feet wide, with an average thickness of 8 inches.

Construction of Corozal cut-off road.—A total of 13,329 cubic yards of earth and rock were excavated and placed in fills, and necessary

concrete culverts were completed, in connection with the construction of a new section of road to replace that portion of Gaillard Highway which passes through the Army post at Corozal. Concrete pavement will be laid during the next dry season. The new road will by-pass this Army post and eliminate the present dangerous traffic condition caused by the heavy traffic from the motor pool and other military activities on the post flowing into the main highway.

GATUN PROJECT

The greater part of the rough grading and fill required in connection with the reconstruction of Canal quarters at Gatun was completed during the fiscal year 1935, together with the construction of the main water supply through the town and the installation of utilities for 25 houses.

GAMBOA PROJECT

On March 1, 1935, municipal work was commenced for the new town of Gamboa, situated on the right bank of the Chagres River where it enters the Canal. The new town is intended primarily for the forces of the dredging division, but will also furnish homes for employees of the lighthouse subdivision and such incidental employees as are necessary as doctors, policemen, and firemen. By the end of the year considerable work had been performed on grading, installation of sewers and water lines and concrete paving.

MADDEN DAM

On April 1, 1935, a part of the work in connection with the completion of the Madden Dam was turned over to the municipal division. This work was divided into two sections. One section included ridge tightening, clay grouting of sinkholes, observation of seepages, construction and maintenance of gravel roads, and numerous small, miscellaneous jobs. The other section covered the repairing of cavitated areas in sluiceways and the construction of bell-mouth sections on the upstream side of the sluiceways.

CITIES OF PANAMA AND COLON

The usual maintenance work was performed on the water and sewer systems and the streets during the year. In addition, the following special projects were in progress during the year: Improving Eighth Street storm drainage, Colon; renewing hydraulic valve in sewer at Colon sump; installation of 10-inch water line at Sixteenth Street, Colon; concreting Paseo Central, Colon; improvement of street drainage, Calle Colon, Panama.

WATER-PURIFICATION PLANTS AND TESTING LABORATORY

During the fiscal year 1935 several important alterations and improvements of a permanent nature were made at the water-purification plants. At the Mount Hope purification plant, this work consisted of overhauling of filters and installation of a redesigned under-drainage system in the filters. At the Miraflores purification plant, a manifold system was installed at the wash water tanks, and necessary changes made in the pipe line between pump station no. 2 wash water tanks and Fort Clayton line, so that all water pumped will be metered by the venturi meter of this station. The testing laboratory carried on a variety of work, making a total of 10,269 tests in connection with 4,313 varied samples including asphalt, cement, concrete, electrolyte for storage batteries, gas, gasoline, grease, water, kerosene, metals and minerals, oils (fuel, Diesel, and lubricating), paint, rock, sand, soil and clay, etc. The principal items tested were water, 4,708; concrete (test cylinders) 1,089; oils (fuel and Diesel), 778; cement, 331; gas, 342; gasoline, 264; lubricating oils, 137.

PUBLIC ORDER

The number of persons placed under arrest during the year was 2,875, of whom 159 were females and 2,716 males, as compared with 154 females and 2,652 males, a total of 2,806, for the previous year. Of the arrests made during the past year, 2,603 were made without warrants and 272 with warrants. Of those arrested, 845, or 29.4 percent, were residents of the Canal Zone; 1,689, or 58.7 percent, were residents of the Republic of Panama; and 341, or 11.9 percent, were transients, consisting mostly of members of ships' crews. A total of 3,103 charges were filed against persons arrested, of which 91, or about 3 percent, were felonies.

The more common causes of arrest were violation of vehicle and traffic regulations, 1,271; loitering, 362; violation of immigration regulations, 290; disturbing the peace, 199; petit larceny, 130; and fugitives from justice, 129. The persons arrested included nationals from 63 countries and territories, and were of 159 different trades and professions.

Homicides totaled eight during the year. Six were due to automobile accidents and two to gunshot wounds. With respect to the latter, charges of first-degree murder were later imposed in both cases.

Suicides during the year numbered 8, of which 3 were by shooting, 2 by taking poison, 1 by hanging, 1 by drowning, and 1 by a cutting instrument. The coroner investigated 61 deaths during the year, of which 19 were from accidental drowning and 13 from natural causes. Four cases were due to undetermined causes.

The number of prisoners serving sentence in the common jails at the end of each month averaged 54. All prisoners who were physically able were employed on municipal work, public improvements, janitor and miscellaneous work at the police and fire stations, and at target ranges. The total value of such common jail labor for the year was \$20,493.69.

Thirty-five convicts were committed to the Canal Zone Penitentiary during the year, with sentences ranging from 3 months to 50 years; a total of 33 were discharged, of whom 1 was pardoned. At the close of the year 62 remained in confinement, as compared with 60 at the end of the preceding fiscal year. Labor performed by convicts during the year was valued at \$21,021.42 on the basis of standard rates of pay. The convicts were employed on road and municipal-improvement work, manufacturing and repairing of prison clothing, and the cultivation of fruits, vegetables, etc., at the penitentiary farm and at the experimental farm at Summit. The total value of fruits, vegetables, and other products of the penitentiary farm amounted to \$5,758.25, as compared to \$5,055.61 for the previous year.

Thirty-nine persons were deported from the Canal Zone by the police during the year. Of this number 24 were convicts who had completed terms of imprisonment and 15 were persons who had been convicted of misdemeanor charges or who were deemed undesirable persons to be permitted to remain in the Canal Zone.

Continuous patrol of the harbors of Balboa and Cristobal was maintained, principally for enforcement of navigation laws and regulations, and for the prevention of smuggling and irregular traffic. A police launch was maintained at Gamboa for the patrol of the Chagres River and the Canal in the vicinity of Gamboa. Another launch was maintained at Gatun for patrol of Gatun Lake and inspection of the 100-foot contour area, to determine if any unauthorized clearings or cultivation were being made, buildings erected, etc. Motorcycle patrols for enforcement of vehicle-traffic regulations and for special emergency police service were continued throughout the year over all streets and roads of the Canal Zone.

Traffic accidents reported in the Canal Zone during the year totaled 483, or an average of 40 per month, resulting in the death of 8 persons and injuries to 185 persons, of whom 57 were pedestrians. Classification of accidents by cause shows that practically all were avoidable and were due to careless and reckless operators. In 21 cases accidents were caused by intoxicated operators. The total number of traffic accidents shows an increase of 92 as compared with the previous fiscal year.

Detectives effected 189 arrests, and, in addition, made 1,280 investigations. The usual routine work was carried on by the criminal identification bureau during the year.

FIRE PROTECTION

During the year 109 fires, 6 false alarms, and 2 emergency alarms were reported. Of these, 51 occurred in property of the Panama Canal, 9 in Panama Railroad property, 2 in United States Army property, 3 in United States Navy property, and 44 in private property. The total estimated loss from all fires during the year amounted to \$779,234.10, of which \$5,555.90 was in Panama Canal property, \$95 in Panama Railroad property, \$10,000 in United States Army property, \$270 in United States Navy property, and \$763,313.20 in private property. A total of \$758,000 of the estimated damage to private property was in commercial ships in Canal waters. The total value of property involved was \$8,648,355.85.

Periodical inspections of all Government buildings, docks, storehouses, etc., were made, and fire extinguishers and other equipment maintained in good condition throughout the year. Seventy-five fire extinguishers and 2,450 feet of fire hose were added to the equipment as replacements.

MAGISTRATES' COURTS**BALBOA**

In the magistrate's court for the town and subdivision of Balboa, 8 cases were pending at the beginning of the fiscal year, 1,664 cases were docketed, and 1,661 were disposed of, leaving 11 cases pending. Of the cases disposed of, 14 were civil and 1,647 were criminal. In the latter, 1,372 resulted in conviction, 153 in acquittal, 72 were dismissed, and 50 were held to the district court. Fines, costs, and forfeitures totaled \$5,242.80.

Under the provisions of the Penal Code of the Canal Zone, as amended, imposition or execution of sentence was suspended in 87 cases and the defendants placed on probation.

CRISTOBAL

In the magistrate's court for the town and subdivision of Cristobal, 7 cases were pending at the beginning of the fiscal year, 1,041 cases were docketed, and 1,047 cases were disposed of during the year, leaving 1 case pending. Of the cases disposed of, 26 were civil and 1,021 were criminal. In the latter, 866 resulted in conviction, 70 in acquittal, 36 were dismissed, 46 were held to the district court, and 3 forfeited.

Under the provisions of the Penal Code of the Canal Zone, as amended, imposition or execution of sentence was suspended in 56 cases, of which 6 defendants were rearrested for violating the terms of probation and were returned to serve the sentences originally imposed.

PARDONS AND REPRIEVES

The pardon board, consisting of five members, acts under appointment of the Governor and in a purely advisory capacity. The retirement from the Panama Canal service of Mr. J. B. Fields left a vacancy on the board which was filled by the appointment of Mr. Oliver Bullock on June 24, 1935. No other changes were made in the personnel of the board.

During the year 21 applications for executive clemency were considered by the board. The exercise of executive clemency was recommended in 7 of these cases and in the remaining 14 cases the denial of the applications was recommended.

PUBLIC SCHOOL SYSTEM

During the year 1 junior college, 2 senior high schools, 2 junior high schools, and 6 elementary schools for white children, and 1 normal and 8 elementary schools for colored children were maintained. All elementary schools are graded. The elementary schools for white children are located at Ancon, Balboa, Pedro Miguel, Paraiso, Gatun, and Cristobal. The elementary schools for colored children are located in La Boca, Red Tank, Chiva Chiva, Paraiso, Gamboa, Frijoles, Gatun, and Silver City, and the normal school for colored children is at La Boca. Except for the fact that in the Canal Zone the schools are situated in the various towns rather than in sections of a city, the school organization is comparable with the usual city school system in the United States, having a superintendent with assistants in general charge and a principal at each school.

The number of pupils on the roll at the end of February 1935, taken as representative, was 3,061 (including the junior college) for the white schools and 3,600 for the colored schools, a total of 6,661. This was an increase of 1.5 percent for the white schools; a decrease of 3.8 percent for the colored schools; and a decrease of 1.4 percent for the total. The net enrollment for the fiscal year was 3,323 white and 3,810 colored, as compared with 3,170 white and 4,128 colored in the preceding year. The average daily attendance at the white schools was 2,797.1, and at the colored schools 3,405.9, a total of 6,203.

The teachers corps of the Canal Zone white schools during the year was composed of 8 principals and 108 teachers; for the colored schools, 8 principals and 82 teachers. The usual high standards as to educational qualifications were exacted in the employment of new teachers. The supervisory staff was reduced under the preceding year by elimination of an assistant supervisor of art. The decrease in enrollment in the white elementary schools made it possible to reduce the number of teachers therein by four. Due to increasing

enrollment in the white junior and senior high schools, and to the fact that the junior college instructors needed to give all their time to college work this year, 1 junior high school and 4 senior high school teachers were added to the staff. Although 1 teacher was added for the new La Boca Normal School (opened Jan. 21, 1935), decreasing enrollment elsewhere made it possible to reduce the total number of colored teachers by 1.

This year saw the graduation of the first class of the Canal Zone junior college. Twenty-four students were granted the degree of Associate in Arts. Of these, 17 have definite plans for continuing their education in United States colleges and universities. They have applied for advanced standing at 11 different institutions and in all cases have been accepted with credit for the work completed here. The courses they expect to pursue are as follows: Engineering, 6; commerce, 4; medicine, 2; liberal arts, 2; library, 1; music, 1; journalism, 1. In addition to the regular courses, the junior college offered a late afternoon course in accounting which enrolled 20 students. The junior college now has a faculty of six instructors.

A normal school, to train teachers for the Canal Zone colored schools, was opened at La Boca on January 21, 1935. Forty students were selected from 353 applicants. It is planned to admit a class of about 20 every other year. Vocational work for both boys and girls was carried forward in the colored schools during the year.

POSTAL SYSTEM

Thirteen post offices were operated throughout the year. At the Madden Dam and Gamboa post offices arrangements were made to have the manager of the commissary at each village act as postmaster, thus obviating the necessity of retaining full-time postal employees at these points.

Gross receipts of the postal service were \$350,737.92, as compared with \$315,516.32 for the previous fiscal year, an increase of \$35,221.60, or about 11 percent. The expenditures aggregated \$306,865.85, as compared with \$254,825 during the previous year, an increase of \$52,040.85, or about 19 percent. This increase in expenditure is due to the setting aside of \$76,094.70 to pay the United States Post Office Department for the transportation of Canal Zone air mail during the fiscal year, and to the restoration of the full rates of pay to all postal employees. After deducting all operating expenses, and taking into account the sum of \$7,200 due the bureau of posts for handling transit air mails for the United States Post Office Department, there remained a surplus of \$43,872.07 at the end of the year, or 12.5 percent of the gross receipts.

The sale of postage stamps, postal cards, stamp books, etc., amounted to \$224,576.96 of the total receipts above mentioned.

There has been no change in the system providing for the issue of nonnegotiable deposit money orders in lieu of postal savings certificates. The system continues to operate satisfactorily and with a minimum of labor and expense. During the year 29,392 deposit money orders were issued amounting to \$1,838,655, compared with 28,845 issued during the previous year aggregating \$1,757,580. A total of 28,125 deposit money orders were paid in the amount of \$1,710,370, compared with 27,945 during the previous fiscal year amounting to \$1,732,715. The balance to the credit of depositors in the deposit money order system increased from \$1,678,470 at the close of last fiscal year to \$1,810,300 at the end of the fiscal year just closed. Since 1920 there has been paid to depositors as interest on deposit money orders the sum of \$247,451.18, while there has been received as postal revenues interest on such deposits amounting to \$499,436.67, resulting in a surplus of \$211,570.89 after deducting accrued interest on June 30, 1935, totaling \$40,414.60 as reported by postmasters.

There were 152,036 fee-paid money orders issued during the year, amounting to \$2,710,180.49 on which fees amounted to \$15,853.43. Compared with the previous year there was an increase of 4,452 in the number of orders issued and an increase of \$521.03 in the amount of fees collected. Regular money orders paid during the year numbered 33,995, amounting to \$478,924.97, compared with 34,104 orders paid during the previous year amounting to \$508,142.69.

Post offices handled 204,466 registered and insured articles and foreign parcel post as compared with 199,200 for the previous fiscal year. Dispatches totaled 92,780 articles subdivided as follows: 18,722 domestic letters, 89 domestic registered parcels, 27,508 foreign letters, 3,646 foreign registered parcels, 37,815 official letters and parcels registered free, 5,000 insured, and C. O. D. parcels.

During the year, 2,295 dispatches of mail were made by the Cristobal post office to the United States and foreign countries, subdivided as follows: (a) By steamers to the United States, 251; (b) by steamers to foreign countries, 2,044. Dispatches numbering 963 were received from the United States by steamer and 2,522 dispatches from foreign countries. The Balboa post office, which dispatches mail to the west coast exchange offices of the United States and Central and South America, made 2,303 and received 1,551 dispatches during the year.

The new 3-cent "Goethals" stamp issue, referred to in the 1934 report, was placed on sale August 15, 1934, to commemorate the twentieth anniversary of the opening of the Panama Canal to commercial traffic. The new issue has been well received by philatelists and local patrons.

AIR MAIL

The air-mail schedules to and via the Canal Zone remained unchanged throughout the year, and dispatches were made with regularity. The schedules continue to be well maintained despite the hazards of long flights. No change was made in the air-mail postage rates to foreign countries during the year, but a special committee from the United States Post Office Department spent several days on the Isthmus recently and obtained data concerning the needs for faster service and a reduction in rates. It has been known for some time that a change in schedules throughout Central and South America has been under consideration and the air lines, in preparation therefor, have had new and faster planes assigned to some of their routes. Undoubtedly there will be changes resulting in improved service, and perhaps cheaper rates, during the present fiscal year.

The Cristobal post office continued to handle all air mail exchanged between the United States and the west coast of South America. The volume of this mail was about 13 percent greater than during the preceding fiscal year and approximately 30 percent in excess of the mail dispatched during 1933. The number of dispatches forwarded during the year was 5,190, and 8,430 were received, compared to 5,005 forwarded and 8,352 received during the preceding year. Dispatches were made to an average of 60 exchange offices and received from an average of 56. This handling entails a considerable amount of work performed for the United States Post Office Department in the preparation and recording of detailed particulars involving the numerous small packages containing only a few letters which comprise a large portion of these dispatches.

Transportation charges on Canal Zone air-mail matter dispatched during the year aggregated \$73,516.19, compared with \$63,978.27 during the preceding year. Amounts aggregating \$56,000 and \$76,094.70, respectively, were obligated during the 2 years to cover the transportation charges on such mail. The expense reports, however, do not include a credit of \$7,200 per annum agreed upon as proper for services rendered the United States Post Office Department for the handling of their transit air mails on the Isthmus.

POST OFFICE BUILDINGS

During February the Pedro Miguel post office was moved into permanent quarters in the former restaurant buildings. This takes care of the problem of a permanent structure for Pedro Miguel, mentioned in a previous report, but it will be necessary to provide funds within the next few years for permanent buildings to replace the frame structures at Gatun and Corozal. The practicability of

the use of the railroad station at Corozal, which is at present unoccupied, is being considered as a permanent site for the Corozal post office.

CUSTOMS

The various activities of the bureau of customs were continued along the lines outlined in previous annual reports. The following is a statistical summary of the principal items, with the figures for the preceding year shown for comparison:

Item	Fiscal year	
	1934	1935
Vessels entered.....	12,066	11,924
Vessels cleared.....	12,061	11,939
Total.....	24,127	23,863
Vessels of United States registry entered.....	5,081	4,771
Vessels of United States registry cleared.....	5,078	4,779
Customs releases on shipments consigned to Panama (Cristobal 11,084 and Balboa 747).....	10,027	11,831
Free entry releases for shipments to employees of U. S. Government.....	4,579	5,706
Arrests for violation of Narcotic Drug Import and Export Act.....	5	0
Arrests for violation of customs regulations.....	0	0
Shipments of household goods of employees of United States, inspected and sealed for shipment to United States.....	108	84
Pieces of freight included in above.....	1,066	558
Invoices certified for shipment to United States.....	459	624
Special customs inspection out of regular hours:		
Cristobal.....	603	721
Balboa.....	419	521
Total.....	1,022	1,242
Fees collected for above.....	\$6,278.25	\$8,746.00
Cargo deposited to be held for orders ("Canal Zone for orders"):		
Cristobal:		
Consignments received.....	573	175
Releases for delivery or forwarding.....	4,396	655
Balboa:		
Consignments received.....	276	30
Releases for delivery or forwarding.....	1,758	174
Chinese passengers arriving.....	682	1,247
Chinese admitted to Panama.....	268	257
Vessels with Chinese crews checked.....	638	561

SHIPPING COMMISSIONER

The shipping commissioner and his deputies have the same powers as shipping commissioners in United States ports and United States consuls in foreign ports with respect to United States seamen. During the year 3,202 seamen were shipped on vessels of the United States and 2,977 discharged. No sick or destitute seamen were returned to the United States at the expense of the appropriation for the relief of destitute American seamen, but 220 were signed on vessels as seamen or workaways and returned to the United States without expense to the Government.

Wages earned by seamen discharged at Canal Zone ports aggregated \$149,534.11; the total approved for deductions on account of

advances, allotments, fines, slop-chest account, etc., was \$55,425.36, and \$94,108.75 was either paid to seamen under the supervision of the deputy shipping commissioners or received on deposit for the seamen by the deputy shipping commissioners. The wages, money, and effects of one American seaman who died in a Canal Zone hospital were remitted to the proper court in the United States for disposition.

ADMINISTRATION OF ESTATES

The public administrator takes charge of all estates within the Canal Zone which require administration and are not administered by others legally entitled to administer them. In the case of estates with total assets exceeding \$1,000 in value the public administrator charges regular commissions fixed by law which are paid into the Treasury of the United States. Commissions amounting to \$911.13 were collected during the fiscal year. The estates of 94 deceased or insane persons were settled, as compared with 96 in the previous year. The amount involved in the settlement of the 94 estates was \$17,629.85. On June 30, 1935, there were 20 estates in course of administration.

LICENSES AND TAXES

Licenses issued for motor vehicles, permits for peddling foodstuffs, the sale of merchandise generally, ships' runners, and similar purposes numbered 11,519 for the year.

The number of motor-vehicle licenses and transfers, and miscellaneous licenses issued during the past 10 years, and the aggregate fees collected therefor are summarized below. These include licenses for official vehicles.

Year	Motor-vehicle licenses	Motor-vehicle transfers	Miscellaneous licenses	Total	Fees
1926.....	4,185	1,192	2,101	7,478	\$30,126.90
1927.....	5,107	1,391	2,401	8,899	34,731.79
1928.....	5,543	1,490	1,876	8,909	36,875.89
1929.....	6,345	1,729	1,093	9,167	40,894.39
1930.....	7,280	1,862	1,064	10,206	45,603.84
1931.....	8,128	2,083	1,443	11,654	51,295.46
1932.....	8,577	1,906	1,312	11,795	52,143.07
1933.....	8,432	2,270	1,155	11,857	50,038.54
1934.....	8,389	2,311	1,392	12,092	52,795.70
1935.....	10,397	2,685	1,122	14,204	56,109.65

FOREIGN CORPORATIONS

Foreign corporations doing business in the Canal Zone are required to secure licenses, and for the fiscal year 83 such corporations, the majority of which are steamship lines and steamship agencies, were licensed. Fees amounting to \$890 were collected. Taxes paid by corporations amounted to \$132.53.

INSURANCE

The license fee for insurance companies doing business in the Canal Zone is \$10. At the end of the fiscal year 12 companies had been given licenses. These companies reported that as of December 31, 1933, 723 policies were in force. During the calendar year 1934, 178 policies were issued and 86 canceled, leaving 815 in force as of December 31, 1934. The policies in force as of December 31, 1934, had a face value of \$2,424,386.02, on which annual premiums totaled \$104,091.05.

During the calendar year 1934 the premiums received by miscellaneous insurance companies, including accident, automobile liability, fire, surety, fidelity, etc., but excluding life insurance, amounted to \$101,146. Losses paid during the year totaled \$45,870.41.

The taxes paid on premiums by all classes of insurance companies amounted to \$3,078.54 for the fiscal year 1934, as compared with \$2,846.74 during the previous year.

One new company was issued a license during the year to transact business in the Canal Zone.

IMMIGRATION VISAS

During the year 42 visas were issued by the executive secretary to alien residents of the Canal Zone going to the United States. Of these, 4 were quota visas, 26 were nonquota visas, and 12 were non-immigrant. Fees collected for visas amounted to \$331.50.

RELATIONS WITH PANAMA

During the year direct correspondence was conducted between the Governments of the Canal Zone and the Republic of Panama with reference to various matters of joint interest, arising from the relations of the two governments and the proximity of their respective areas. Most of this correspondence was of routine nature dealing with problems relating to aviation, customs duties, inspection, extradition, garbage collection, immigration, automobile licenses and registration, municipal improvements, annual and complimentary passes over the Panama Railroad, public health, vital statistics and court records, etc., while matters of less routine nature included registrations or repatriation of aliens, and land rentals.

COMMERCIAL AVIATION

The following statement presents a résumé of the passenger and express mail traffic of the various commercial airways operating between the Canal Zone and foreign countries, as well as the company

operating in intra-Canal Zone, in the fiscal year 1935 as compared with 1934:

	Pan American Airways, Pan American-Grace Airways, and U. M. C. A.		Isthmian Airways	
	1934	1935	1934	1935
NUMBER OF PASSENGERS				
Canal Zone and foreign:				
Incoming.....	1,350	1,922		
Outgoing.....	1,224	1,788		
Total.....	2,574	3,710		
Intra-Canal Zone: Passengers carried.....			10,097	9,481
AIR EXPRESS AND MAIL				
Air express and mail carried (pounds).....	150,064	69,342		

¹ Does not include mail carried by Pan American-Grace Airways.

The increased traffic reflected in the above figures for the commercial airways operating between the Canal Zone and foreign countries is due to the use for part of the year of Albrook Field, Canal Zone, instead of Paitilla Airport, Panama City.

CODIFICATION OF CANAL ZONE LAWS

The revision and codification of the laws of the Canal Zone, as authorized by the act approved May 17, 1928, was completed during the preceding fiscal year, including the appendix to the code and the indexing and binding of the code, and copies of the bound volume were delivered by the Government Printing Office, Washington, in December 1934.

The codifier of the laws returned to the Canal Zone in October 1934 for the purpose of completing the revision program by effecting a complete revision of the Executive orders relating to the Panama Canal and the Canal Zone. It is expected that this task will be finished during the fiscal year 1936.

SECTION V

FINANCIAL AND STATISTICAL STATEMENTS

Financial statements of major interest relative to the Panama Canal are presented in this section. These statements are abstracted from the annual report of the accounting department.

ACCOUNTING SYSTEM

The accounting system inaugurated in 1932 on the recommendation of the Bureau of Efficiency to conform as far as practicable to the principles and practices approved by the Interstate Commerce Commission and State boards regulating public utilities was continued in effect during the fiscal year 1935 with such minor changes as were necessary to conform to changing conditions.

The accounting system fixes July 1, 1921, as the close of the construction and development period of the Panama Canal, and all interest on United States Treasury funds advanced up to that date has been capitalized. Capital interest subsequent to that date, while not included on the balance sheet, is considered as a statistical charge to operating expenses for comparison with net revenues. Additions to the capital-investment account are made from time to time by the inclusion of the cost of new capital additions (such as Madden Dam), deductions are made of the amounts of withdrawals and retirements of capital assets, such as through the sale of property or the absorption of value of buildings or equipment through charges for depreciation.

Based on the foregoing principles, the capital investment at the beginning of the fiscal year 1935 stood at \$543,744,707.09. Interest at 3 percent on this amount is \$16,312,341.21, and such interest is considered a charge to operating expenses for the year.

At the end of the fiscal year 1935, following the same principles, the capital investment was \$546,636,490.05, and the interest charge for the fiscal year 1936 will be computed on that amount.

The net revenues of the Canal during the fiscal year 1935 amounted to \$14,519,506.01 on Canal operations and \$1,021,216.61 on business operations, a total of \$15,540,722.62. With respect to the capital investment of \$543,744,707.09 at the beginning of the year, this revenue represents a return of 2.86 percent. The corresponding figure for 1934 was 3.37 percent and for 1933 was 2.23 percent.

OPERATION WITH PANAMA RAILROAD CO.'S FUNDS

The results from the operations of the railroad proper and its various business units on the Isthmus are shown in detail in the ac-

counts of the Panama Railroad Co., and detailed statement of revenue, expenses, and statistics of all railroad industries, changes in the capital account, and the results from the operations of the steamship line, appear in the regular annual reports of the Panama Railroad Co. Inasmuch as these activities are related closely to the operation of the Panama Canal, major facts with regard to them are summarized in the report of the Canal.

The operations of the railroad proper, harbor terminals, coaling plants, stables, and baggage transfer, were continued throughout the fiscal year under the direction of the general manager; the telephone system under the electrical engineer of the Panama Canal; renting of lands and buildings under the land agent; and the hotels, commissaries, dairy farm and subsidiary activities, under the chief quartermaster of the Panama Canal. A review of these activities is presented in section II of this report under the heading "Business Operations Under the Panama Railroad Co."

The net result from all Panama Railroad operations on the Isthmus during the fiscal year 1935 was a profit of \$899,195.79, as compared with \$1,156,738.14 for 1934, a decrease of \$257,542.35 for the year.

PANAMA CANAL OPERATIONS

The major financial result of Panama Canal operations is presented hereinafter in tables no. 1 to 27, with supplementary comments and explanations.

The following is a list of all of the tables and bureau reports contained in the annual report of the accounting department. The tables and reports nos. 28 to 58, inclusive, are not published because they are concerned principally with details of operations which lack general interest, and their publication would be an unwarranted expense. The complete report for the accounting department, as well as those of the other departments and divisions, may be consulted at the office of the Governor or at the Washington office of the Panama Canal. For purposes of reference, the complete list of tables and reports for the accounting department is published below. Following the list are presented the major tables nos. 1 to 27, inclusive, with various notes of explanation.

GENERAL BALANCE SHEET

ASSETS

Table no.

1. General balance sheet.
2. Canal fixed property and equipment.
3. Administrative and civil property.
4. Business fixed property and equipment.
5. Public works, Republic of Panama.
6. Revenues due United States Treasury.

Table no.

7. Security deposit funds.
8. Independent trust funds.
9. Cash receipts and disbursements.
10. Accounts receivable registered and outstanding.
11. Stores.
12. Work in progress.
13. Deferred charges.

LIABILITIES

14. Capital investment.
15. Accounts payable.
16. Reserve for replacements.
17. Reserve for repairs.
18. Reserve for vacation pay (funded).
19. Deferred credits.
20. Income, expenses, and net revenue (current).
21. Revenues, expenses, and computed surplus.
22. Capital refundments (miscellaneous receipts and Canal appropriations).
23. Balance of revenues and refundments.

DETAILS OF OPERATIONS FOR PROFIT AND LOSS

(Summaries on tables 20 and 21)

24. Canal revenues.
25. Canal earnings, expenses, and net revenues.
26. Business revenues, expenses, and net revenues.

MISCELLANEOUS

27. Balance in appropriation and fund accounts.

ADDENDA NOT PUBLISHED

(May be seen at Balboa Heights or the Washington office of the Panama Canal—see prefatory notes.)

Table no.

28. Cost of electric current.
29. Cost of dredging.
30. Collection of United States funds by collector.
31. Money order business, Canal Zone.
32. Postal Service revenues.
33. Death and injury accidents and payments.
34. Payments by the paymaster.
35. Audited pay rolls.
36. Pay roll deductions, gold employees.
37. Cost of production of water.
38. Money order statistics.
39. Postal Service statistics.
40. Clubs and playgrounds, income and expenditures.
41. Clubs and playgrounds, balance sheet.
42. Commissary coupons issued.
43. Cost of commissary supplies.
44. Rent collections from nonemployees.
45. Land rent collections, Panama Railroad.
46. Silver quarters statistics.
47. Accounts payable registered, Panama Canal.

Table no.

48. Accounts payable registered, Panama Railroad.
49. Employees' bonds.
50. Report of accounting bureau.
51. Report of pay-roll section.
52. Payments account of death and injuries.
53. Report of personal injury claims.
54. Report of freight and cargo claims.
55. Report of collections from silver employees.
56. Report of general inspection bureau.
57. Report of time inspection bureau.
58. Report of property inspection bureau.

TABLE NO. 1.—General balance sheet, June 30, 1935

ASSETS	
Capital assets:	
Canal fixed property and equipment (table no. 2).....	\$497,528,543.14
Administrative and civil property (table no. 3).....	14,658,720.61
Business fixed property and equipment (table no. 4).....	29,067,383.76
Total capital assets.....	\$541,254,647.51
Reimbursable capital expenditures:	
Public works, Republic of Panama (table no. 5).....	1,261,842.54
Revenue due U. S. Treasury (table no. 6).....	202,567.62
Special funds:	
Security deposit funds (table no. 7).....	\$442,096.51
Independent trust funds (table no. 8).....	2,345,966.21
Total special funds.....	2,788,062.72
Working assets:	
Appropriated cash in U. S. Treasury (table no. 9).....	\$6,277,162.17
Appropriated cash with fiscal officers (table no. 9).....	2,155,715.10
Accounts receivable (table no. 10).....	648,346.83
Stores (table no. 11).....	4,229,033.79
Work in progress (table no. 12).....	46,423.78
Total working assets.....	13,356,681.67
Deferred charges (table no. 13).....	132,619.69
Total assets.....	558,996,421.75
LIABILITIES	
Capital investment:	
Net appropriations by Congress.....	\$402,984,129.62
Interest on appropriations.....	143,652,360.43
Total capital investment (table no. 14).....	546,636,490.05
Special fund obligations (see assets).....	2,788,062.72
Working liabilities:	
Accounts payable (table no. 15).....	1,268,504.27
Funded reserves:	
Reserve for replacements (table no. 16).....	\$1,917,316.65
Reserve for repairs (table no. 17).....	916,462.30
Reserve for vacation pay (table no. 18).....	465,967.00
Total funded reserves.....	3,299,745.95
Deferred credits (table no. 19).....	697,275.51
Revenues and refundments:	
Net revenues to June 30, 1934.....	190,976,688.78
Net revenues fiscal year 1935 (table no. 20).....	15,540,722.62
Total net revenues (table no. 21).....	206,517,411.40

TABLE NO. 1.—*General balance sheet, June 30, 1935*—Continued

LIABILITIES—continued

Revenues and refundments—Continued.

Canal depreciation (unfunded)	\$17, 157, 438. 14	
Plant depreciation (unfunded)	2, 100, 000. 00	
Total	225, 774, 849. 54	
Less capital refundments (table no. 22)	221, 468, 506. 29	
Balance of revenues and refundments (table no. 23)		\$4, 306, 343. 25
Total liabilities		558, 996, 421. 75

The terms and arrangement of the foregoing balance sheet follow closely the generally accepted principles of corporate accounting, except as to the last item "Revenues and refundments." The statutes require that receipts for tolls, civil revenues, and net profits on business operations shall be covered into the United States Treasury, and relinquished from control of the Panama Canal.

Funds for current operating expenses and capital construction are appropriated by the Congress, and for accounting purposes are considered as provided from the tolls and other receipts covered into the Treasury. Practically all receipts other than those cited above are repayable to Canal appropriations, and may be reexpended, but as the Canal is deprived of tolls revenues, its principal source of income, the reexpendable receipts are insufficient to provide for operation and maintenance, thus requiring the Canal to submit its expenditure program annually to the Congress.

Total net revenues, appearing under the caption "Revenues and refundments", represent the accumulated operating earnings of the Panama Canal before capital interest charges. This net revenue, however, has been covered into the United States Treasury in the form of tolls and other receipts. It therefore follows that net capital refundments and net revenues earned will always be approximately the same, except for the fluctuation of unexpended appropriated cash and other current items.

The items "Canal depreciation (unfunded)" and "Plant depreciation (unfunded)" have been charged against "Net revenues", but are restored thereto on the balance sheet exhibit because the corresponding cash revenue to cover these charges has been either covered into the United States Treasury in the form of tolls, or deducted from appropriations by the Congress for current operating expenses of the Canal.

The "Funded reserves", under a separate balance sheet caption are also charged against current operations, but differ from the "Unfunded" reserves in that these charges are included in operating appropriations, and are therefore represented in the appropriated fund balances under "Working assets."

These various fund requirements leave the Panama Canal balance sheet without an equivalent for the usual corporate "Surplus account", since any surplus is included in the tolls covered into the Treasury, by law. However, the equivalent for "Surplus account" is shown on table no. 21, which compares "Total net revenues" of \$206,517,411.40, appearing on the balance sheet, with the computed interest on the capital investment, by years, from July 1, 1922, but no interest charge against the Canal is actually made by the United States Treasury.

The general accounts in the above balance sheet are shown in detail under the table numbers listed opposite each item.

TABLE NO. 2.—*Canal fixed property and equipment, fiscal year 1935*

CANAL FIXED PROPERTY	Balance July 1, 1934	Additions	Withdrawals	Balance June 30, 1935
Channels, harbors, and basins:				
Balboa to Pedro Miguel.....	\$24,309,928.86			\$24,309,928.86
Pedro Miguel to Gatun.....	113,466,691.77			113,466,691.77
Gatun to Cristobal.....	12,829,445.51			12,829,445.51
Breakwaters:				
Naos Island.....	1,075,874.10			1,075,874.10
Colon-East.....	3,994,727.10			3,994,727.10
Colon-West.....	4,528,829.57			4,528,829.57
Locks:				
Miraflores.....	24,586,787.54			24,586,787.54
Pedro Miguel.....	16,770,362.46			16,770,362.46
Gatun.....	37,914,498.12			37,914,498.12
Dams:				
Miraflores.....	1,228,561.63			1,228,561.63
Pedro Miguel.....	457,302.32			457,302.32
Madden.....	11,512,438.40	\$952,675.82	\$3,073,805.94	9,391,308.28
Gatun.....	10,475,943.56			10,475,943.56
Gatun-Mindi Levee.....	148,974.22			148,974.22
Spillways:				
Miraflores.....	1,398,684.94			1,398,684.94
Gatun.....	4,323,538.02			4,323,538.02
Aids to navigation:				
Lighthouses and beacons.....	548,769.52			548,769.52
Buoys and other markers.....	295,473.80			295,473.80
Buildings and landings.....	127,318.29			127,318.29
Wharves and piers:				
Balboa (Nos. 14 to 19).....	3,317,826.59			3,317,826.59
Cristobal (Nos. 6, 14, 15) No. 14, completed.....	2,684,825.22			2,753,278.57
No. 15 (part).....		19,112.78		
Gamboa (part).....		49,340.57		
		10,142.49		10,142.49
Drydocks:				
Balboa.....	3,576,872.10			3,576,872.10
Cristobal.....	480,206.81	168,033.44		647,409.73
Drydock crane (part).....		67,626.00		
Drydock blocking (part).....		9,375.85		
Old French drydock.....			77,832.37	
Coaling plants:				
Balboa.....	3,679,797.59			3,679,797.59
Cristobal.....	2,284,568.35			2,284,568.35
General capital expenditures:				
Purchase price new Panama Canal Co. Treaty payment to Republic of Pan- ama, 1904.....	1 31,717,335.97			31,717,335.97
Annual treaty payments to Republic of Panama, 1913-21.....	10,000,000.00			10,000,000.00
Relocation, Panama R. R.....	2,250,000.00			2,250,000.00
Reequipment of Panama R. R.....	9,800,626.46			9,800,626.46
Depopulation, Canal Zone.....	3,247,332.11			3,247,332.11
Interest during construction period.....	2,701,016.24			2,701,016.24
	143,652,360.43			143,652,360.43
Total Canal fixed property.....	489,386,917.60	1,276,306.95	3,151,638.31	487,511,586.24

¹ Original purchase price of \$40,000,000 less Panama R. R. Co. capital stock and sales and transfers of property acquired.

TABLE NO. 2.—*Canal fixed property and equipment, fiscal year 1935—Continued*

CANAL FIXED PROPERTY	Balance July 1, 1934	Additions	Withdrawals	Balance June 30, 1935
CANAL EQUIPMENT				
Tugs.....	\$1,400,106.24			\$1,753,475.04
<i>Arraijan</i> (part).....		\$195,434.39		
<i>Athajuela</i> (part).....		195,434.41		
<i>Coco Solo</i> , sold.....			\$37,500.00	
Supply boats.....	51,544.48			51,544.48
Launches.....	332,699.73			359,277.46
<i>Cormorant</i> , engine.....		350.00		
<i>Gar</i> , purchased.....		9,248.00		
<i>Puto Feal</i> , built.....		17,830.79		
<i>Toucan</i> , engine.....		4,000.00		
<i>Paja</i> , retired.....			3,451.06	
No. 12, retired.....			1,400.00	
Dredges.....	2,570,236.01			2,570,236.01
Lighters and scows.....	1,445,031.08			1,486,989.94
No. 17, transferred.....			15,000.00	
No. 20, rebuilt.....		29,000.00		
No. 127, completed.....		23,640.49		
No. 204, rebuilt.....		4,318.37		
Floating cranes.....	659,524.29			659,524.29
Craneboats.....	517,833.70			517,833.70
Barges.....	320,897.70			497,406.73
Derrick barge No. 157, purchased and rebuilt.....		64,285.20		
Grader barge No. 21, rebuilt (part).....		112,223.83		
Ferry boats.....	255,860.15			255,860.15
Floating caisson (locks).....	347,868.15			347,868.15
Towing locomotives (locks).....	1,449,538.01	218.65		1,449,756.66
Excavators.....	17,370.00			27,370.00
No. 2 purchased.....		10,000.00		
Cranes.....	16,030.00			16,030.00
Marine salvage equipment.....	23,077.77			23,784.29
Diving barge built.....		706.52		
Total Canal equipment.....	9,407,617.31	666,690.65	57,351.06	10,016,956.90
Total Canal fixed property and equipment.....	498,794,534.91	1,942,997.60	3,208,989.37	497,528,543.14

Withdrawal of \$3,073,805.94 of Madden Dam capital represents transfers to other capital accounts as follows: Madden Road, \$1,461,-130.93; Gaillard Highway, \$53,361.74; Madden Dam power system, \$1,545,977.64; various, \$13,335.63.

TABLE NO. 3.—*Administrative and civil property, fiscal year 1935*

	Balance July 1, 1934	Additions	Withdrawals	Balance June 30, 1935
Buildings:				
Office buildings.....	\$2,053,731.53			\$2,065,539.61
Building no. 112, Pedro Miguel, conversion.....		\$11,808.08		
Gorgas Hospital.....	1,800,047.49			1,801,871.49
Building no. 273, Ancon, transfer.....		1,824.00		
Corozal Hospital.....	556,912.16			520,996.33
Building no. 559 ward, demolished.....			\$35,915.83	
Colon Hospital.....	314,615.86			314,615.86
Dispensaries.....	211,324.38			211,324.38
Palo Seco leper colony.....	76,928.46			76,928.46
Quarantine stations.....	63,392.70			63,392.70
Other health department structures.....	97,901.94			97,901.94
Building no. 1034, La Boca, demolished.....			100.00	
Clubs and playgrounds.....	448,636.50			462,208.35
Building no. 365, Ancon clubhouse: Conversion.....		11,489.28		
Equipment.....		2,082.57		
Post offices.....	22,352.62			20,252.62
Building no. 183, Pedro Miguel, demolished.....			2,100.00	
Schoolhouses.....	1,580,264.78			1,657,854.27
High school and junior college, Balboa (part).....		77,589.49		
Fire stations.....	104,876.74			104,876.74

TABLE NO. 3.—*Administrative and civil property, fiscal year 1935—Continued*

	Balance July 1, 1934	Additions	Withdrawals	Balance June 30, 1935
Buildings—Continued.				
Police stations.....	\$32,719.47			\$123,394.87
Building no. 801, Balboa police station:				
Transfer.....		\$80,771.75		
Conversion (part).....		9,903.65		
Prisons.....	30,000.00			30,000.00
Courthouses.....	130,892.39			130,892.39
Other buildings and structures.....	247,581.46			166,809.71
Building no. 801, transferred.....			\$80,771.75	
Permanent townsites.....	1,421,711.73			1,554,911.13
Gamboa.....		79,161.44		
Gatun.....		51,805.13		
Gorgas Hospital area.....		2,232.83		
Roads, streets, and sidewalks.....	2,839,269.09			4,530,858.56
Widen Fort Randolph Road.....		30,147.89		
Rebuilding Gaillard Highway, Paraiso to Summit.....		78,558.01		
Relocate Gaillard Highway at Corozal (part).....		11,811.97		
Rebuilding Bolivar Highway.....		8,564.51		
Streets, Gamboa.....		36,693.67		
Miscellaneous construction.....		4,857.97		
Madden Road, transfer.....		1,461,130.93		
Gaillard Highway, transfer.....		53,361.74		
Miscellaneous, transfer.....		6,462.78		
Storm sewers.....	556,604.79	18,373.77		574,978.56
Street-lighting system.....	145,545.05	3,666.99		149,212.64
Total, administrative and civil property..	12,735,309.74	2,042,298.45	118,887.58	14,658,720.61

TABLE NO. 4.—*Business fixed property and equipment, fiscal year 1935*

	Balance July 1, 1934	Additions	Withdrawals	Balance June 30, 1935
BUSINESS FIXED PROPERTY				
Hydroelectric plant, Gatun.....	\$1,755,561.45			\$1,755,561.45
Miraflores Power Plant.....	1,524,416.92			1,525,616.79
Fencing.....		\$1,199.87		
Substations.....	1,344,644.35			1,375,306.34
Transformer improvements, Balboa substation.....		18,144.00		
Additions and changes, Summit substation.....		11,318.13		
Fencing, Miraflores, substation.....		1,199.86		
Transmission system.....	1,318,308.21			1,325,355.78
Additional ground wires.....		7,047.57		
Distribution system.....	1,354,330.62			1,376,137.90
Extensions.....		21,807.28		
Madden Dam system, transfer.....		1,545,977.64		1,545,977.64
Total, electric light and power system....	7,297,261.55	1,606,694.35		8,903,955.90
Electric work.....	202,842.24			202,842.24
Zone water system.....	862,160.01			867,001.42
Water-line extensions.....		4,841.41		
Zone-Panama water system.....	1,842,509.46			1,842,509.46
Zone-Colon water system.....	819,487.36			819,487.36
Total, water system.....	3,524,156.83	4,841.41		3,528,998.24
Balboa shops.....	2,395,623.67			2,402,651.71
Fencing (part).....		11,676.36		
Equipment, transferred.....			\$4,648.32	
Cristobal shops.....	781,901.30			546,168.52
Fencing (part).....		5,015.99		
Lighting, roadway.....		2,872.87		
Equipment, transferred.....			243,621.64	
Total, mechanical division.....	3,177,524.97	19,565.22	248,269.96	2,948,820.23
Balboa fuel-oil plant.....	763,767.51	3,242.07		767,009.58
Cristobal fuel-oil plant.....	1,071,882.91	3,066.64		1,074,949.55
Total, fuel-oil plants.....	1,835,650.42	6,308.71		1,841,959.13

TABLE No. 4.—*Business fixed property and equipment, fiscal year 1935—Continued*

	Balance July 1, 1934	Additions	With- drawals	Balance June 30, 1935
BUSINESS FIXED PROPERTY—continued				
General storehouses.....	\$1,072,621.43			\$1,139,733.27
Oil and paint store, Mount Hope.....		\$54,210.72		
Forage shed, Mount Hope.....		9,625.64		
Boat landing, Mount Hope.....		3,275.48		
Motor transportation.....	35,888.18			35,888.18
Motor car repair shop.....	19,439.77			19,439.77
Building repairs and construction.....	55,463.05			55,463.05
Panama Canal press.....	161,000.00			161,000.00
Gold quarters.....	6,157,446.95			6,589,806.61
Madden Dam quarters, transfer.....		12,500.00		
New quarters, Cristobal district.....		9,708.33		
New quarters, Gatun district.....		331,420.33		
New quarters, Ancon-Balboa district.....		39,854.38		
Raising houses, Balboa.....		53,374.03		
Miscellaneous additions.....		7,998.20		
Demolished.....			\$11,400.00	
Adjustment transfers:				
To permanent townsites.....			2,232.83	
To roads, streets, and sidewalks.....			6,462.78	
To Gorgas Hospital.....			2,400.00	
Silver quarters.....	686,496.49			690,095.88
Rebuilt at Summit.....		3,849.39		
Demolished.....			250.00	
Rented buildings.....	324,590.08			320,940.38
Stall built at Gatun.....		174.02		
Stalls demolished.....			3,823.72	
District quartermasters' supplies.....	11,157.70			18,964.46
New gasoline station, Cristobal, completed.....		7,806.76		
Total, business fixed property.....	24,561,539.66	2,171,206.97	274,839.29	26,457,907.34
BUSINESS EQUIPMENT				
Electric light and power system:				
Electric ranges.....	189,400.47	11,493.88		200,896.35
Electric heaters.....	16,799.78	1,033.81		17,833.59
Electric refrigerators.....		517.50		517.50
Electric work:				
Machinery and tools.....	34,843.14			34,843.14
Automobiles.....	6,514.59			3,779.54
Truck S11, retired.....			2,735.05	
Ditcher.....	1,675.00			1,675.00
Telephone, telegraph, and signal work: Machinery and tools.....	7,226.40			7,226.40
Water system: Machinery and tools.....	22,325.18			22,325.18
Municipal engineering work:				
Machinery and tools.....	156,325.19	7,199.01		163,524.20
Road rollers.....	27,332.27			27,332.27
Shops and dry docks:				
Machinery and tools.....	1,176,961.24	70,619.38		1,495,850.58
Transfer.....		248,269.96		
Fuel-oil plants: Machinery and tools.....	5,678.93			5,678.93
General stores: Equipment.....	940.00			940.00
Motor transportation:				
Machinery and tools.....	10,408.27			10,408.27
Automobiles.....	446,194.13	36,841.15	49,299.50	433,735.78
Mules.....	2,801.21			2,801.21
Motor car repair shops: Machinery and tools.....	21,818.83			21,818.83
Building repairs and construction: Machinery and tools.....	57,666.34		4,028.78	53,637.56
Panama Canal press: Machinery and tools.....	17,939.68	74,469.40		92,409.08
District quartermasters' supplies: Equipment.....	7,893.25			7,893.25
Farm bureau:				
Equipment.....	1,145.50			1,145.50
Mules.....	1,086.76			1,086.76
Launch La Garza.....	2,117.50			2,117.50
Total, business equipment.....	2,215,093.66	450,446.09	56,063.33	2,609,476.42
Total, business fixed property and equipment.....	26,776,633.32	2,621,653.06	330,902.62	29,067,383.76

TABLE NO. 5.—*Public works in cities of Panama and Colon, fiscal year 1935*

	Panama	Colon	Total
Status of capital cost to June 30, 1935:			
Construction cost:			
Waterworks and sewers.....	\$876,353.22	\$623,883.68	\$1,500,236.90
Pavements.....	592,913.23	625,619.03	1,218,532.26
Total construction cost.....	1,469,266.45	1,249,502.71	2,718,769.16
Amortization:			
Waterworks and sewers.....	462,014.43	328,745.22	790,759.65
Pavements.....	320,159.54	346,007.43	666,166.97
Total amortization.....	782,173.97	674,752.65	1,456,926.62
Capital cost reimbursable:			
Waterworks and sewers.....	414,338.79	295,138.46	709,477.25
Pavements.....	272,753.69	279,611.60	552,365.29
Capital value, June 30, 1935.....	687,092.48	574,750.06	1,261,842.54
Operating detail, fiscal year, 1935:			
Operation, maintenance, and repairs:			
Waterworks and sewers.....	73,526.56	40,620.54	114,147.10
Pavements.....	7,114.79	16,225.13	23,339.92
Proportion, Zone system.....	97,687.29	37,351.47	135,038.76
Street cleaning and garbage collection.....	77,000.25	37,718.07	114,718.32
Total.....	255,328.89	131,915.21	387,244.10
Interest at 2 percent per annum:			
Waterworks and sewers.....	8,424.37	6,000.78	14,425.15
Pavements.....	5,545.65	5,685.09	11,230.74
Proportion, Zone system.....	13,696.95	7,508.43	21,205.38
Total.....	27,666.97	19,194.30	46,861.27
Amortization:			
Waterworks and sewers.....	18,515.10	13,188.53	31,703.63
Pavements.....	12,188.24	12,494.71	24,682.95
Total.....	30,703.34	25,683.24	56,386.58
Total charged to water rentals.....	313,699.20	176,792.75	490,491.95
Water rental collections in the Republic of Panama.....	313,699.20	176,792.75	490,491.95

The Panama Canal supplies water to the cities of Panama and Colon from the Canal Zone water system, and maintains the sewers and streets in the two cities under a contract entered into between the Panama Canal and the Republic of Panama in 1907. The Panama Canal collects the water rentals from the residents of these two cities and uses the funds to cover the cost of the water and maintenance of sewers and streets, interest on the unamortized investment at 2 percent per annum, and amortization based on 50 years from 1907. Interest on the investment amounted to \$1,477,662.10, and \$1,456,926.62 repaid on the capital cost have been covered into the United States Treasury as miscellaneous receipts, United States revenues.

TABLE NO. 6.—*Revenue due United States Treasury*

	Fiscal year 1934	Fiscal year 1935
Cash.....	\$160,315.36	\$202,467.62
Outstanding audited bills.....	100.00	100.00
Total.....	160,415.36	202,567.62

Collections for account of miscellaneous receipts form no part of the working capital of the Panama Canal, since these funds must by law be immediately covered into the United States Treasury and relinquished from control of the Panama Canal. These collections consist mainly of tolls, licenses, court fees, and fines, and amortization of public works in Panama and Colon.

Owing to the above restrictions these items are segregated from cash and accounts pertaining to appropriated funds available for expenditure by Canal authorities.

TABLE 7.—*Treasury and fiscal officers' security deposit accounts, fiscal year 1935*

	U. S. Treasury	Disbursing clerk, Washing- ton, D. C.	Paymaster, Canal Zone	Collector, Canal Zone	Total
Receipts:					
Cash on hand July 1, 1934.....				\$467,940.84	\$467,940.84
Deposits.....	\$5,250.56	\$107,732.66	\$4,602,065.04	28,017,828.71	32,732,876.97
Total cash debits.....	5,250.56	107,732.66	4,602,065.04	28,485,769.55	33,200,817.81
Disbursements:					
Panama Canal bills.....				25,657,222.54	25,657,222.54
Individuals and companies.....		100,000.00		2,363,552.79	2,463,552.79
Refunds.....		145.96		23,278.16	23,424.12
Civil Service retirement fund.....		7,586.70	359,352.50		366,939.20
Unclaimed deposits remitted to the Treasury.....				4,870.11	4,870.11
Panama Railroad commissary and miscellaneous services.....			4,242,712.54		4,242,712.54
Cash on hand June 30, 1935.....	5,250.56			436,845.95	442,096.51
Total cash credits.....	5,250.56	107,732.66	4,602,065.04	28,485,769.55	33,200,817.81

Transactions by the disbursing clerk, Washington, D. C., consist principally of collections from employees for payment into the Civil Service retirement fund. There are also occasional deposits by individuals and companies guaranteeing the payment of Panama Canal and Panama Railroad Co. bills.

The paymaster's account consists entirely of collections from Panama Canal and Panama Railroad Co. employees for commissary coupon books, miscellaneous sales, and service rendered by the Panama Railroad Co. and the Panama Canal.

In the collector's account are deposited funds by banks, individuals, and companies to guarantee payment of bills rendered by the Panama Canal and the Panama Railroad Co., also deposits to guarantee fulfillment of contracts.

The disbursement shown under "Panama Canal bills", represents the revenue earned by the Panama Canal on bills charged against deposits, principally for tolls and other shipping activities. Payments to individuals and companies represent amounts paid the Panama Railroad Co. covering bills charged against depositors, and

"refunds" covers amount refunded to various depositors of the difference between the amount deposited and the charges made against such deposits.

TABLE No. 8.—*Receipts and disbursements by collector of Canal Zone funds*

FISCAL YEAR 1934		FISCAL YEAR 1935	
Balance on hand July 1, 1933.....	\$2, 239, 639. 54	Balance on hand, July 1, 1934.....	\$2, 108, 059. 69
Receipts:		Receipts:	
Clubhouse funds... \$399, 320. 34		Clubhouse funds... \$673, 246. 68	
Trust funds..... 22, 589. 63		Trust funds..... 33, 936. 96	
Money-order funds. 2, 294, 376. 57		Money-order funds. 2, 449, 016. 53	
Interest..... 70, 867. 05		Interest..... 73, 173. 17	
	<u>2, 787, 153. 59</u>		<u>3, 229, 373. 34</u>
Total.....	5, 026, 793. 13	Total.....	5, 337, 433. 03
Disbursements:		Disbursements:	
Clubhouse funds... 432, 385. 92		Clubhouse funds... 659, 559. 57	
Trust funds..... 22, 712. 81		Trust funds..... 30, 122. 15	
Money-order funds. 2, 426, 396. 50		Money-order funds. 2, 258, 688. 37	
Interest..... 37, 238. 21		Interest..... 43, 096. 73	
	<u>2, 918, 733. 44</u>		<u>2, 991, 466. 82</u>
Balance on hand June 30, 1934.....	2, 108, 059. 69	Balance on hand June 30, 1935.....	2, 345, 966. 21
Clubhouse funds... 44, 770. 63		Clubhouse funds... 58, 457. 74	
Trust funds..... 7, 703. 37		Trust funds..... 11, 518. 18	
Money-order funds. 1, 971, 863. 21		Money-order funds. 2, 162, 191. 37	
Interest..... 83. 541. 48		Interest..... 113, 617. 92	
Postal savings..... 181. 00		Postal savings..... 181. 00	

TABLE No. 9.—Cash receipts and disbursements for account of the United States, fiscal year ended June 30, 1935

CASH RECEIPTS

	Disbursing clerk, Washington, D. C.	Paymaster, Canal Zone	Collector, Canal Zone	Total fiscal officers	United States Treasurer	Total
On hand July 1, 1934, by appropriations and funds:						
Maintenance and operation, Panama Canal	\$457,205.60	\$1,503,430.71	\$117,215.30	\$2,077,851.61	\$8,944,027.26	\$11,021,878.87
Sanitation, Canal Zone, Panama Canal	14,773.68	64,750.51	8,268.86	87,783.05	5,582.85	93,365.90
Civil government, Panama Canal and Canal Zone	2,330.70	54,119.86	1,326.39	57,776.95	224,655.62	282,432.57
Postal funds, Canal Zone (special fund)	2,575.00	18,716.71	39,392.91	58,684.62	36,884.01	95,568.63
National Industrial Recovery, War, Panama Canal, 1933-35	37,273.63	54,294.25		91,477.88	100,000.00	191,477.88
Repatriation of unemployed aliens, Panama Canal			160,315.36	160,315.36	150,000.00	310,315.36
Miscellaneous receipts, United States revenues			467,940.84	467,940.84		467,940.84
Special deposits						
Total	512,138.61	1,095,222.04	794,449.66	3,001,830.31	9,461,149.74	12,462,980.05
Appropriations for fiscal year 1935:						
Maintenance and operation, Panama Canal					4,971,490.00	4,971,490.00
Sanitation, Canal Zone, Panama Canal					768,501.00	768,501.00
Civil government, Panama Canal and Canal Zone					792,935.00	792,935.00
Total					6,532,926.00	6,532,926.00
Transfers between fiscal officers:						
Maintenance and operation, Panama Canal		10,299,873.98		14,590,873.98	237,344.86	14,837,218.84
Sanitation, Canal Zone, Panama Canal	4,300,000.00	1,359,831.41		1,439,831.41	22,670.11	1,462,501.52
Civil government, Panama Canal and Canal Zone	80,000.00	1,001,538.47		1,041,538.47	103.99	1,041,642.46
Postal funds, Canal Zone (special fund)	40,000.00	200,000.00		200,000.00	263,920.21	463,920.21
National Industrial Recovery, War, Panama Canal, 1933-35		123,000.00		123,000.00	23,121.27	146,121.27
Repatriation of unemployed aliens, Panama Canal		50,039.00		50,039.00		50,039.00
Total	4,420,000.00	13,034,282.86		17,454,282.86	547,160.44	18,001,443.30
Collections:						
Maintenance and operation, Panama Canal		183,897.07	7,291,461.99	7,640,371.92	260.86	7,640,632.78
Sanitation, Canal Zone, Panama Canal	165,012.86		552,429.89	578,630.70	99,976.04	678,606.74
Civil government, Panama Canal and Canal Zone	26,200.81	52.00	101,047.53	101,203.10	12,500.09	113,703.10
Postal funds, Canal Zone (special fund)	1,130.00		263,986.29	265,136.29		265,136.29
Repatriation of unemployed aliens, Panama Canal			39.00	39.00		39.00
Miscellaneous receipts, United States revenues	2,086.03	51	23,514,832.57	23,516,919.11		23,516,919.11
Special deposits	107,732.66	4,002,065.04	28,017,828.71	32,727,626.41	5,250.56	32,732,876.97
Total	302,285.93	4,786,014.62	59,741,625.98	64,829,936.53	117,987.46	64,947,913.99
Total cash debits	5,234,444.54	19,515,519.52	60,536,075.04	85,286,039.70	16,659,223.64	101,945,263.34

CASH DISBURSEMENTS

Covered into the United States Treasury, business profits, fiscal year 1934, maintenance and operation, Panama Canal.	\$2,086.03	\$0.51	\$23,472,680.31	\$23,474,766.85	\$722,520.51	\$722,520.51
Tolls and other miscellaneous receipts, miscellaneous receipts, United States revenues.						23,474,766.85
Economy act impoundings:						
Maintenance and operation, Panama Canal.					41,988.00	41,988.00
Sanitation, Canal Zone, Panama Canal.					9,000.00	9,000.00
Postal funds, Canal Zone (special fund).					22,145.34	22,145.34
Total.					73,133.34	73,133.34
Less civil government, Panama Canal and Canal Zone (refunded).					2,563.15	2,563.15
Total.	2,086.03	.51	23,472,680.31	23,474,766.85	70,570.19	70,570.19
Transfers between fiscal officers:					793,090.70	793,090.70
Maintenance and operation, Panama Canal.	237,231.86		7,290,036.98	7,537,218.84	7,300,000.00	14,837,218.84
Sanitation, Canal Zone, Panama Canal.	22,670.11		554,831.41	577,501.52	853,000.00	1,462,501.52
Civil government, Panama Canal and Canal Zone.	103.99		101,538.47	101,642.46	940,000.00	1,041,642.46
Postal funds, Canal Zone (special fund).	1,725.00		262,195.21	263,920.21	200,000.00	1,463,920.21
National Industrial Recovery, War, Panama Canal, 1933-35.	23,121.27			23,121.27	123,000.00	146,121.27
Reparation of unemployed aliens, Panama Canal.			39.00	39.00	50,000.00	50,039.00
Total.	284,902.23		8,218,541.07	8,503,443.30	9,498,000.00	18,001,443.30
Disbursements:						
Maintenance and operation, Panama Canal.	4,257,269.45	10,677,010.05		14,934,279.50	37,093.47	14,971,345.97
Sanitation, Canal Zone, Panama Canal.	94,566.20	1,299,901.97		1,391,468.17	1,391,990.89	1,391,990.89
Civil government, Panama Canal and Canal Zone.	25,933.03	997,555.72		1,023,518.75	48,131.02	1,071,649.77
Postal funds, Canal Zone (special fund).		184,326.31		184,326.31		184,326.31
National Industrial Recovery, War, Panama Canal, 1933-35.	13,202.36	177,186.34		190,388.70		190,388.70
Reparation of unemployed aliens, Panama Canal.		27,098.15		27,098.15		27,098.15
Special deposits.	107,732.66	4,602,065.04	28,048,923.60	32,758,721.30		32,758,721.30
Total.	4,498,723.70	17,965,153.58	28,048,923.60	50,512,800.88	85,720.21	50,598,521.09
On hand June 30, 1935:						
Maintenance and operation, Panama Canal.	427,667.15	1,310,191.71	108,740.31	1,846,599.17	6,051,548.00	7,898,147.17
Sanitation, Canal Zone, Panama Canal.	3,738.18	124,679.95	5,857.34	134,275.47	2,207.28	2,136,482.75
Civil government, Panama Canal and Canal Zone.	16,377.25	58,144.61	835.45	75,357.31	44,626.74	119,981.05
Postal funds, Canal Zone (special fund).		34,390.40	41,183.99	75,574.39	78,658.88	154,233.27
National Industrial Recovery, War, Panama Canal, 1933-35.	950.00	17.91		907.91	121.27	1,089.18
Reparation of unemployed aliens, Panama Canal.		22,940.85		22,940.85	100,000.00	122,940.85
Miscellaneous receipts, United States revenues.			202,467.62	202,467.62		202,467.62
Special deposits.			436,845.95	436,845.95	5,250.50	412,096.51
Total.	448,732.58	1,550,365.43	795,930.66	2,795,028.67	6,282,412.73	9,077,441.40
Total cash credits.	5,234,444.54	19,515,519.52	60,536,075.64	85,286,039.70	16,659,223.64	101,945,263.34

During the current fiscal year the Treasurer of the United States advanced to the fiscal officers of the Panama Canal the sum of \$9,498,000 and disbursed directly from the Treasury \$85,720.21, a total of \$9,583,720.21. Against this amount the fiscal officers of the Panama Canal remitted to the Treasury the sum of \$547,160.44, and direct collections by the Treasurer amounted to \$117,987.46, a total of \$665,147.90, resulting in a net withdrawal of appropriated funds from the United States Treasury amounting to \$8,918,572.31, as compared with \$9,708,808.30 withdrawn the previous fiscal year.

Additional details of collections by the collector on the Isthmus are shown in table no. 30, and of "Special deposit funds" in table no. 7.

TABLE NO. 10.—*Accounts receivable*
REGISTERED DURING THE YEAR

	Fiscal year 1934	Fiscal year 1935
Repaid to appropriations:		
Panama Railroad Co.....	\$1,685,081.92	\$1,949,491.43
Other departments of the United States Government.....	1,463,208.82	1,254,388.79
Individuals and companies.....	3,283,409.10	3,147,497.35
National industrial recovery.....	579,421.07	102,362.36
Total.....	7,011,120.91	6,453,739.93
Miscellaneous receipts:		
Tolls.....	24,065,705.02	23,339,238.05
Other miscellaneous receipts.....	8.00	
Total.....	24,065,713.02	23,339,238.05
Total accounts receivable registered.....	31,076,833.93	29,792,977.98
Number of bills registered.....	38,233	38,505

OUTSTANDING ACCOUNTS RECEIVABLE

	Fiscal year 1934	Fiscal year 1935
Audited bills.....	\$656,670.11	\$615,852.78
Hospital certificates.....	22,621.98	27,985.74
Injury compensation.....	3,716.68	4,380.48
Unredeemed commissary coupons.....	143.54	117.83
Total.....	683,152.31	648,346.83

The outstanding balance at the end of the fiscal year includes all accounts due the Panama Canal except items pertaining to miscellaneous receipts (table no. 6) and a few items of utility service, principally for employees, which are not credited to earnings until collected, usually by pay-roll deductions.

TABLE NO. 11.—*Material and supplies*

	Fiscal year 1934	Fiscal year 1935
Stock on hand, first of year:		
Balboa store.....	\$2,205,356.31	\$2,027,376.53
Medical store.....	63,877.08	72,537.33
Administration building store.....	21,271.72	20,571.92
Paraiso store.....	566,721.60	375,608.90
Cristobal store.....	390,656.72	391,636.67
Locks store.....	583,758.91	584,799.35
Fuel-oil plants.....	84,973.44	28,967.86
Panama Canal press.....	59,323.62	61,317.75
Sand and gravel pile.....	64,111.30	74,710.93
Division stores.....	340,342.76	192,529.59
Total stock-card value.....	4,380,393.46	3,830,056.83

TABLE No. 11.—*Material and supplies*—Continued

	Fiscal year 1934	Fiscal year 1935
Reserve for inventory adjustments.....	\$419,609.98	\$341,996.14
Book value of stock on hand.....	3,960,783.48	3,488,060.69
Receipts of material:		
Purchases for stock.....	3,279,422.63	3,799,300.86
Purchases for divisions.....	1,073,096.02	770,280.03
Local production, service charges, etc.....	528,066.22	754,160.35
Book value of receipts.....	4,880,584.87	5,323,741.24
Total charges to stock.....	8,841,368.35	8,811,801.93
Issues and sales of material:		
Issues to business divisions.....	3,214,847.81	2,197,088.93
Issues to Canal divisions.....	952,846.46	1,288,994.48
Variation in division stores.....	147,813.17	¹ 36,762.03
Total issues.....	4,315,507.44	3,449,321.38
Sales.....	1,037,800.22	1,133,446.76
Total issues and sales.....	5,353,307.66	4,582,768.14
Stock on hand, end of year:		
Balboa store.....	2,027,376.53	2,346,452.72
Medical store.....	72,537.33	59,056.21
Administration-building store.....	20,571.92	20,810.09
Paraiso store.....	375,608.90	413,646.02
Cristobal store.....	391,636.67	589,883.84
Locks store.....	584,799.35	569,218.77
Fuel-oil plants.....	28,967.86	76,013.81
Panama Canal press.....	61,317.75	65,973.41
Sand and gravel pile.....	74,710.93	205,074.98
Division stores.....	192,529.59	229,291.62
Total stock-card value.....	3,830,056.83	4,575,421.47
Reserve for inventory adjustments.....	341,996.14	346,387.68
Book value of stock on hand.....	3,488,060.69	4,229,033.79

¹ Indicates reduction of issues and sales.

In the foregoing table all values are stated at stock-card prices, which cover the cost of material delivered into general storehouses, except for necessary adjustments due to price averaging of various consignments of the same article, inventory discrepancies, exchange of containers, etc.

Issues to Canal divisions are made at cost; but issues to business divisions and sales to commercial interests are surcharged above the stock-card values shown in the foregoing table to produce the total revenue shown under "General storehouses", in table no. 26, against "Gross expenses", which include storehouse operations as well as the cost of goods sold.

TABLE No. 12.—*Work in progress*

	Fiscal year 1934	Fiscal year 1935
Electrical division.....	\$1,915.61	\$3,437.19
Municipal division.....	543.39	3,688.78
Shops and drydocks.....	25,798.64	35,187.39
Building repairs and construction.....	1,335.94	2,259.49
Panama Canal press.....	3,451.98	1,850.93
Total.....	33,045.56	46,423.78

This account covers the amounts expended on uncompleted jobs and will ultimately be cleared to operating expenses of the divisions indicated, with corresponding credits to their revenues after application of authorized surcharge.

TABLE No. 13.—*Deferred charges*

	Fiscal year 1934	Fiscal year 1935
Clubs and playgrounds.....		\$72. 33
Health department.....	\$7, 202. 07	258. 37
Port captain, Balboa.....	2, 057. 09	3, 546. 67
Dredging division.....	6, 437. 40	41, 957. 67
General accounts, suspense.....		14, 475. 10
Electrical division.....	247. 79	599. 97
Municipal division.....	1, 204. 52	
Shops and drydocks.....	19, 482. 49	29, 693. 62
General storehouses.....	4, 855. 67	60. 00
Building repairs and construction.....	22, 556. 33	28, 611. 92
Gold quarters.....	40. 10	
District quartermasters' supplies.....	1, 577. 46	2, 107. 24
Public works:		
Panama.....	173. 54	299. 06
Colon.....	19, 718. 04	10, 937. 74
Total.....	85, 552. 50	132, 619. 69

This account covers expenses incurred for account of divisions indicated but which are not chargeable to operating accounts of the current year. These amounts are cleared as soon as values are consumed.

TABLE No. 14.—*Capital investment*

Appropriations for Canal construction to June 30, 1921 (detail in Annual Report for 1924, table no. 3).....	\$386, 910, 301. 00
Deduct value of capital stock of the Panama Railroad Co.....	7, 000, 000. 00
Net construction appropriations.....	379, 910, 301. 00
Annual payments to the Republic of Panama, 1913 to 1921 (State Department).....	2, 250, 000. 00
Maintenance funds diverted to construction, 1922 to June 30, 1935.....	20, 823, 828. 62
Total cash investment.....	402, 984, 129. 62
Interest on construction funds (compounded annually) 1904 to 1921.....	143, 652, 360. 43
Total capital investment.....	546, 636, 490. 05

The capital investment account covers the following assets as of June 30, 1935, shown in comparison with assets on June 30, 1934:

	June 30, 1934	June 30, 1935
Canal fixed property and equipment (table no. 2).....	\$498, 794, 534. 01	\$497, 528, 543. 14
Administrative and civil property (table no. 3).....	12, 735, 309. 74	14, 658, 720. 61
Business fixed property and equipment (table no. 4).....	26, 776, 633. 32	29, 067, 383. 76
Public works, Republic of Panama (table no. 5).....	1, 318, 229. 12	1, 261, 842. 54
Proportion of working capital (table no. 23).....	4, 120, 000. 00	4, 120, 000. 00
Total capital assets.....	543, 744, 707. 09	546, 636, 490. 05

The construction period of the Panama Canal is considered as extending to the close of the fiscal year 1921, and computed interest during this period has been charged to capital account.

The capital investment of \$546,636,490.05 at the close of 1935 is considered as representing a perpetual bond issue with interest at 3 percent, except that sales and final withdrawals of capital assets will be deducted, and current additions to capital assets will be added to the capital investment, but no reduction in bonded liability will be made for accrued depreciation of capital assets while in service.

Interest on the capital investment from 1922 to date is considered as a charge to operating expenses, and while this charge does not appear on the balance sheet a statement of such interest compared with net revenues, by years, is shown in table no. 21. Interest for the current fiscal year is based upon the capital investment of \$543,744,-707.09, as of June 30, 1934, and amounts to \$16,312,341.21. Interest for the ensuing year will be based upon the capital investment of \$546,636,490.05, as of June 30, 1935.

TABLE No. 15.—*Outstanding accounts payable*

	Fiscal year 1934	Fiscal year 1935
United States invoices.....	\$81,319.60	\$140,116.11
Isthmus vouchers.....	197,591.33	104,408.41
Current pay rolls.....	867,889.06	991,162.50
Unpaid salaries and wages.....	27,228.87	27,631.51
Drums, carboys, and reels.....	5,358.59	5,871.72
Local purchases.....	¹ 223.27	¹ 85.98
Total.....	1,179,164.18	1,268,504.27

¹ Denotes debit.

The above table covers all current obligations of the Panama Canal, except deposits to guarantee payment of bills which are covered by table no. 7, security deposits, and table no. 8, trust funds.

TABLE No. 16.—*Reserve for replacements (funded)*

	Fiscal year 1934	Fiscal year 1935
Canal equipment:		
Tugs.....	\$745,869.38	\$468,607.29
Supply boats.....	41,931.60	20,499.21
Launches.....	150,959.78	148,188.48
Dredges.....	375,115.79	473,935.79
Lighters and scows.....	275,109.16	316,766.13
Craneboats.....	4,000.00	27,885.67
Barges.....	99,809.39	¹ 58,355.94
Ferry boats.....	26,709.49	38,709.49
Excavators.....	17,370.00	8,119.97
Cranes.....	5,432.05	6,500.65
Marine salvage equipment.....	16,121.86	5,432.57
Reserve equipment.....	106.82	106.82
Total Canal equipment.....	1,758,535.32	1,456,396.13
Business fixed property:		
Electric light and power system.....	348,284.22	353,477.31
Electric work.....	7,844.90	11,858.06
Water system.....	334,159.17	361,067.56
Shops and drydocks.....	47,267.08	75,642.17
Fuel-oil plant.....	483,742.04	559,493.35
General storerooms.....	47,396.16	71,441.12
Motor transportation.....	9,012.83	8,558.22
Motor car repair shops.....	14,130.41	15,284.21
Building repairs and construction.....	1,774.14	12,455.81

TABLE No. 16.—*Reserve for replacements (funded)*—Continued

	Fiscal year 1934	Fiscal year 1935
Business fixed property—Continued.		
Panama Canal press.....	\$13,988.00	\$17,216.00
Gold quarters.....	229,667.71	191,201.45
Silver quarters.....		6,600.00
Rented buildings.....	94,310.16	87,290.46
District quartermasters' supplies.....	¹ 1,757.70	83.05
Hotel Tivoli.....	68,885.55	68,885.55
Colliers.....	72,145.46	72,145.46
Coal barges.....	50,000.00	50,000.00
Total business fixed property.....	1,820,850.13	1,902,669.78
Business equipment:		
Electric light and power system.....	9,041.50	¹ 3,170.06
Electric work.....	54,784.95	54,301.78
Telephone, telegraph, and signal work.....	13,563.30	8,830.39
Water system.....	25,882.97	25,486.59
Municipal work.....	105,082.24	86,332.10
Shops and drydocks.....	90,615.81	135,387.76
Fuel-oil plants.....	6,664.20	6,161.62
General storehouses.....	28,800.72	40,647.02
Motor transportation.....	129,020.66	109,057.30
Motor car repair shops.....	435.59	2,109.57
Building repairs and construction.....	48,056.97	38,619.25
Panama Canal press.....	36,456.13	40,879.06
District quartermasters' supplies.....	5,927.26	6,608.02
Hotel Tivoli.....	44,539.07	44,539.07
Farm bureau.....	2,271.31	2,461.27
Total business equipment.....	601,142.68	598,250.74
Total business fixed property and equipment.....	2,421,992.81	2,500,920.52
Total reserve for replacements.....	4,180,528.13	4,017,316.65
Less transfer to plant depreciation (unfunded).....		2,100,000.00
Total net reserve for replacements.....	4,180,528.13	1,917,316.65

¹ Denotes debit.

The foregoing table covers the amount of funds available for the replacement of fixed property and equipment. During the year there was added to the replacement reserve by charges to operating expenses, and from proceeds of sales, approximately \$1,071,600.

During the year the following charges, in round figures, were made against replacement reserves: Construction of tugs *Arraijan* (part), \$195,400 and *Alhajuela* (part), \$195,400; reconstruction of supply boat (part), \$24,000; derrick barge, \$64,000; grader barge (part), \$112,000; miscellaneous floating equipment renewals and improvements, \$66,850; electric power system replacements and improvements, \$116,500; water system replacements and improvements, \$26,000; Cristobal shops improvements, \$44,000; motor-car replacements, \$43,000; gold quarters construction and improvements, \$178,500; remodeling restaurant buildings, \$27,500; miscellaneous business property and equipment replacements and improvements, \$141,650, a total expenditure of \$1,234,800.

In accordance with the recommendation of the Appropriations Committee as submitted to Congress, the sum of \$2,100,000 was released from funded replacement reserves in June 1935 to supplement Canal appropriation for maintenance and operation for the fiscal year 1936. This transfer, together with the expenditures cited above,

make a total charge to replacement reserves of \$3,334,800, against accruals of \$1,071,600, or a net reduction in replacement reserve of \$2,263,200.

Against the combined reserves available for replacements and repairs at the close of the fiscal year 1935, amounting to \$2,834,000, as shown in the foregoing table and in table no. 17 following, approximately \$2,000,000 has already been allotted for expenditure in the fiscal year 1936.

TABLE NO. 17.—*Reserve for repairs (funded)*

	Fiscal year 1934	Fiscal year 1935
Canal equipment:		
Tugs.....	\$148,903.79	\$99,181.91
Supply boats.....	17,298.97	16,276.82
Launches.....	83,244.95	73,676.93
Dredges.....	100,934.56	52,185.35
Lighters and scows.....	184,708.40	186,669.56
Craneboats.....	1,500.00	3,918.90
Barges.....	46,065.87	68,859.41
Ferry boats.....	5,856.73	8,813.10
Total Canal equipment.....	563,915.33	487,028.34
Business fixed property:		
Electric light and power system.....	70,705.03	83,785.03
Electric work.....	881.09	1,252.61
Shops and drydocks.....	30,353.45	30,406.58
Wharves and piers.....	35,349.25	52,949.25
Fuel-oil plants.....	101,397.96	88,456.17
General storehouses.....	36,281.19	37,947.08
Building repairs and construction.....		300.00
Panama Canal press.....	3,759.01	3,634.44
Total business fixed property.....	278,726.98	298,731.16
Business equipment:		
Electric work.....	180.50	420.50
Municipal work.....	31,709.72	24,459.23
Shops and dry docks.....	75,787.20	74,963.83
Motor transportation.....	4,560.96	26,699.16
Building repairs and construction.....	10,785.33	1,385.26
Panama Canal press.....	1,200.07	1,342.76
Farm bureau.....	1,000.40	1,432.06
Total business equipment.....	125,224.18	130,702.80
Total business fixed property and equipment.....	403,951.16	429,433.96
Total reserve for repairs.....	967,866.49	916,462.30

¹ Denotes debit.

On July 1, 1934, the reserve for extraordinary repairs amounted to \$967,866.49, to which was added during the year \$775,749.59 by charges to operating expenses. Expenditures of \$827,153.78 were charged against this reserve, leaving a balance on June 30, 1935, of \$916,462.30 available for general overhaul of floating equipment and extraordinary repairs to business property. (For obligations against the combined balance of replacement and repair reserves, see remarks under table no. 16.)

TABLE NO. 18.—*Reserve for vacation pay (funded)*

	Fiscal year 1934	Fiscal year 1935
Electric work.....	\$107,386.67	\$116,496.13
Telephone, telegraph, and signal work.....	9,788.37	10,148.32
Municipal work.....	51,559.27	65,454.44
Shops and drydocks.....	174,637.81	205,064.78
Motor transportation.....	10,761.49	19,591.86
Motor-car repair shops.....	7,502.20	18,896.84
Building repairs and construction.....	27,474.16	21,445.84
Madden Dam division.....	38,420.59	-----
Fortifications division.....	13,369.90	8,868.79
Total.....	440,900.46	465,967.00

The foregoing table represents the amount of cash held in reserve for vacation pay due employees of the principal business divisions. This fund is created by adding a percentage to the direct gold labor charges for work performed by the division listed above to the credit of this account. The account is debited with the amount paid to employees when leave is actually taken.

TABLE NO. 19.—*Deferred credits*

	Fiscal year 1934	Fiscal year 1935
Executive offices.....	\$1,306.25	\$5,727.28
Accounting office.....	2,800.00	2,271.50
Civil government.....	5,361.61	9,920.30
Postal service.....	56,050.00	132,094.70
Health department.....	9,783.47	27,231.62
Office engineer.....	2,375.00	11,511.41
Surveys.....	718.43	3,322.49
District quartermaster:		
Balboa.....	3.00	-----
Pedro Miguel.....	-----	105.93
Gatun.....	-----	149.78
Cristobal.....	-----	2,310.00
Port captain, Balboa.....	3,802.57	260,350.00
Lighthouse subdivision.....	-----	23,000.00
Pacific locks.....	-----	1,653.44
Dredging division.....	2,600.00	10,000.00
General accounts, suspense.....	1,630.57	595.99
Electrical division.....	¹ 3,325.81	8,916.45
Municipal division.....	34,952.17	32,338.46
Shops and drydocks.....	28,505.12	68,655.49
General storehouses.....	1,500.09	2,099.24
Motor transportation.....	2,750.00	6,716.94
Motor-car repair shops.....	43.11	-----
Building repairs and construction.....	10,455.09	20,768.01
Gold quarters.....	-----	12,233.60
District quartermasters' supplies.....	-----	294.04
Farm bureau.....	7,780.82	7,677.34
Nautical charts and publications.....	1,109.11	994.62
Madden Dam division.....	135,633.87	-----
Public works, Panama.....	¹ 28.50	-----
Contingencies:		
Maintenance and operation.....	45,492.83	45,472.93
Sanitation.....	647.82	716.48
Civil government.....	148.07	148.07
Total.....	352,094.69	697,275.51

¹ Denotes debit.

This account covers expenses accrued or estimated which have been charged to operating accounts but for which it was impracticable to institute corresponding payments at the close of the accounting period. These amounts are cleared as soon as corresponding charges are passed for payment or contingent expenses arise.

TABLE NO. 20.—*Consolidated statement of income, expenses, and net revenues*

	Fiscal year 1934	Fiscal year 1935
Canal operations:		
Canal revenues:		
Tolls.....	\$24,065,065.16	\$23,338,977.90
Postal surplus.....	25,361.53	7,264.32
Other miscellaneous receipts.....	71,305.14	74,693.36
Total Canal revenues (table no. 24).....	24,161,731.83	23,420,935.58
Canal earnings (table no. 25).....	2,950,695.35	3,116,756.27
Total revenues.....	27,112,427.18	26,537,691.85
Canal expenses:		
Executive department.....	340,961.00	412,477.77
Clubs and playgrounds.....	208,311.88	108,355.00
Accounting department.....	445,367.47	496,118.53
Washington office.....	223,170.60	253,100.70
Civil government.....	968,383.06	1,036,636.68
Postal service.....	161,640.39	263,820.18
Health department.....	1,263,143.42	1,495,872.91
Office engineer.....	97,323.90	113,495.96
Section of surveys.....	95,852.36	99,307.73
Public buildings and grounds.....	286,939.68	333,590.09
Marine division.....	1,335,867.24	1,453,849.80
Locks operation and maintenance.....	1,062,280.60	1,335,329.96
Locks overhaul.....		537,755.26
Dams and spillway.....	50,845.27	43,534.26
Dredging division.....	1,803,923.68	2,076,586.54
Municipal expenses.....	262,227.90	307,790.06
Proportion of general-stores expense.....	182,000.00	197,913.00
Railroad-tracks maintenance.....	15,679.85	20,131.75
Recruiting and repatriating employees.....	25,928.23	47,960.33
Transportation of employees on Isthmus.....	120,000.00	120,000.00
Damage to vessels.....	59,916.81	1,210.56
Miscellaneous general expense.....	5,690.50	6,723.49
Depreciation on fixed property.....	1,006,625.28	1,006,625.28
Annual payment to the Republic of Panama.....	250,000.00	250,000.00
Total Canal expenses.....	10,302,079.12	12,018,185.84
Net Canal revenues (table no. 25).....	16,810,348.06	14,519,506.01
Fixed capital charge.....	15,392,677.01	15,538,640.64
Surplus (or deficit).....	1,417,671.05	¹ 1,019,134.63
Business operations:		
Business revenues.....	15,858,897.27	15,988,932.34
Business expenses.....	14,492,142.15	14,967,715.73
Net business revenues (table no. 26).....	1,366,755.12	1,021,216.61
Fixed capital charge.....	783,324.77	773,700.57
Surplus.....	583,430.35	247,516.04
Combined operations:		
Revenues.....	42,971,324.45	42,526,624.19
Expenses.....	24,794,221.27	26,985,901.57
Net revenues.....	18,177,103.18	15,540,722.62
Fixed capital charge at 3 percent.....	16,176,001.78	16,312,341.21
Surplus (or deficit).....	2,001,101.40	¹ 771,618.59
Capital investment (table no. 14).....	539,200,059.23	543,744,707.09
Combined net revenues.....	18,177,103.18	15,540,722.62
Percent of capital return.....	3.37	2.86

¹ Deficit.

A summary comparison of net revenues and capital interest, by years, from 1922 to date, is shown in table no. 21 following, together with a brief description of accounting policy governing charges to operating expenses.

TABLE No. 21.—*Revenues, expenses, and computed surplus*

Fiscal year	Tolls	Civil revenues	Business profits	Total revenues	Net appropriation expenses ¹	Net revenues	Capital interest, 3 percent ²	Computed surplus
1914 to 1921.....	\$44,555,500.98	\$1,420,566.05	\$1,100,309.54	\$47,086,376.57	\$45,986,067.03	\$1,100,309.54	-----	\$1,100,309.54
1922.....	11,193,383.47	192,208.85	323,259.16	11,708,851.48	8,169,017.63	3,539,833.85	\$15,759,105.50	³ 12,219,271.65
1923.....	17,507,630.52	184,213.54	1,140,642.50	18,832,486.56	7,940,777.56	10,891,709.00	15,759,105.50	³ 4,867,396.50
1924.....	24,289,603.16	392,250.73	901,624.12	25,583,478.01	8,623,905.39	16,959,572.62	15,759,105.50	1,200,467.12
1925.....	21,374,664.12	207,954.04	765,916.85	22,343,535.01	8,396,693.44	13,981,841.57	15,759,105.50	³ 1,777,263.93
1926.....	22,927,456.03	217,680.50	841,310.29	23,986,446.82	8,243,468.47	15,742,978.35	15,796,305.50	³ 53,327.15
1927.....	24,217,185.32	391,623.50	876,536.80	25,485,345.62	9,247,715.02	16,237,630.60	15,830,655.50	406,975.10
1928.....	26,943,513.11	232,532.57	736,719.43	27,912,765.11	9,201,200.82	18,711,564.29	15,845,453.84	2,866,110.45
1929.....	27,123,534.33	243,391.39	737,850.26	28,104,775.98	9,887,150.71	18,217,625.27	15,875,152.13	2,342,473.14
1930.....	27,077,117.36	349,255.35	760,971.66	28,187,344.37	9,593,920.93	18,593,423.44	15,900,652.13	2,692,771.31
1931.....	24,644,550.39	346,630.35	562,764.17	25,553,344.91	10,393,353.53	15,159,991.38	15,951,052.13	³ 791,060.75
1932.....	20,706,568.49	327,444.23	557,005.41	21,591,018.16	9,889,211.84	11,751,806.32	15,914,378.57	³ 4,162,482.25
1933.....	19,021,158.61	310,014.16	1,133,708.62	21,060,881.39	9,165,672.02	11,911,209.37	15,993,180.28	³ 4,081,970.91
1934.....	24,065,065.16	96,666.67	1,366,753.12	25,528,484.95	7,351,353.77	18,177,131.18	16,176,001.78	2,001,131.40
1935.....	23,338,977.90	81,957.68	1,021,216.61	24,442,152.19	8,901,423.57	15,540,722.62	16,312,341.21	³ 771,618.59
Total.....	359,595,908.95	4,993,789.61	12,828,680.57	377,418,379.13	170,900,967.73	206,517,411.40	222,631,595.07	³ 16,114,183.67

¹ After deduction of Canal earnings repaid to appropriations.² Interest prior to 1922 is included in capital investment account.³ Deficit.

The purpose of this table is to present a statistical summary of net earnings of the Panama Canal on a basis reasonably comparable with corporate practice, but it is obvious that the cost of Canal construction and development could not have been financed from corporate funds on an interest basis as low as 3 percent, although this rate is considered reasonable for Government borrowings over an indefinite period.

Whatever difference exists in interest rates between Government and corporate financing must necessarily be considered as a charge to the value of the Canal as an instrument of national defense, because the use of an interest rate appreciably higher than 3 percent would increase the capital investment to a figure so high that it would preclude reasonable probability that Canal earnings could ever overtake the compounding interest on operating deficits.

The date determined for transferring the interest burden from capital to operating account, fixed at the close of the fiscal year 1921, is necessarily arbitrary, but represents a consensus of competent opinion. Interest chargeable to operations is not included on the balance sheet, and no interest charge against the Canal is actually made by the United States Treasury.

Total revenues on the foregoing statement represent receipts which must be covered into the United States Treasury and relinquished from control of the Panama Canal. Earnings repayable to Canal appropriations, and reexpendable by the Canal, are deducted from gross operating expenditures, in order to present a comparison of funds covered into the Treasury with funds chargeable to operating account, exclusive of capital additions.

Operating expenses include depreciation charges based upon the estimated life of plants and equipment; and also a depreciation charge of approximately \$1,000,000 per year on depreciable items of general property of an undetermined life. While this latter amount is small in comparison with capital values, the greater portion of Canal construction costs cover waterways and harbors which are in the nature of geographical changes and which do not depreciate; in fact, constant dredging operations, the cost of which is charged to current expenses, are gradually deepening, straightening, and widening Canal channels and basins.

The absence of tax charges, ordinarily included in corporate expenses, is compensated for by the inclusion in Canal operating accounts of the direct costs of civil government, health, and welfare activities. Neither capital nor operating expenses of the Panama Canal include the cost of the Military and Naval Establishments on the Isthmus; however, all important exchanges of services with these interests are covered by cash settlements, or reciprocal allowances.

While exact reconciliations with corporate practice are manifestly impossible, it is believed that the accounting procedure established compensates for major differences, and that the net results shown in the foregoing tabulation afford a reasonably accurate statement of Canal operations on the basis of a public utility.

TABLE NO. 22.—*Capital refundments*
MISCELLANEOUS RECEIPTS COVERED INTO THE U. S. TREASURY

Fiscal year	Tolls	Postal receipts	Taxes, fees, fines, etc.	Business profits	Miscellaneous ¹	Total
1922.....	\$11,205,886.64	\$117,047.24	\$45,201.62	\$621,272.19	\$60,000.00	\$12,049,407.69
1923.....	17,228,097.42	117,173.59	45,846.19	323,259.16	153,898.37	17,868,274.73
1924.....	24,486,652.08	119,364.27	57,049.31	1,140,642.50	270,807.97	26,074,516.13
1925.....	21,999,629.39	136,032.67	56,506.22	901,624.12	55,286.36	22,549,078.76
1926.....	22,920,422.67	142,854.91	63,433.56	765,916.85	49,177.00	23,941,804.99
1927.....	24,239,775.87	144,542.94	67,601.53	841,310.29	251,473.37	25,544,704.00
1928.....	26,955,647.14	147,502.27	73,118.06	876,536.80	81,541.51	28,134,345.78
1929.....	27,054,536.55	162,590.89	72,651.38	736,719.43	104,948.94	28,131,447.19
1930.....	27,121,531.94	261,183.41	76,986.81	737,850.26	75,227.77	28,273,080.19
1931.....	24,670,281.59	257,061.52	80,053.25	760,971.66	64,300.78	25,832,668.80
1932.....	20,776,860.08	241,447.36	75,319.54	562,764.17	92,520.30	21,748,911.45
1933.....	19,464,173.04	236,572.53	71,207.83	557,095.44	890,289.84	21,219,338.68
1934.....	24,135,261.01	20,124.04	71,092.79	611,423.74	2,035,500.15	26,873,401.73
1935.....	23,297,587.74	-----	71,844.72	722,520.51	175,904.58	24,267,857.55
Total.....	314,956,643.16	2,103,497.64	927,912.81	10,159,907.12	4,360,876.94	332,508,837.67

TOTAL APPROPRIATIONS

Fiscal year	Maintenance and operation	Sanitation	Civil government	Miscellaneous appropriation ²	Annual payment to Panama	Total
1922.....	\$7,250,000	\$850,000	\$900,000	\$21,500	\$250,000	\$9,271,500.00
1923.....	2,659,434	525,000	930,000	16,800	250,000	4,381,234.00
1924.....	5,079,683	575,000	930,000	17,520	250,000	6,852,203.00
1925.....	5,851,210	586,266	991,670	-----	250,000	7,679,146.00
1926.....	7,140,000	653,216	942,150	-----	250,000	8,985,366.00
1927.....	5,986,094	670,000	999,980	-----	250,000	7,906,074.00
1928.....	5,830,000	670,000	1,100,000	-----	250,000	7,850,000.00
1929.....	6,832,000	722,000	1,172,400	-----	250,000	8,976,400.00
1930.....	8,000,000	820,000	1,201,000	-----	250,000	10,271,000.00
1931.....	10,162,470	753,900	1,295,190	-----	250,000	12,461,560.00
1932.....	9,359,808	782,189	1,351,689	-----	250,000	11,743,686.00
1933.....	11,891,011	755,650	1,300,000	-----	250,000	14,196,661.00
1934.....	11,172,700	698,426	1,235,278	1,150,000	250,000	14,506,404.00
1935.....	4,971,490	768,501	792,935	-----	250,000	6,782,926.00
Total.....	102,185,900	9,830,148	15,142,292	1,205,820	3,500,000	131,864,160.00
Less expenditure for capital construction (table no. 14).....						20,823,828.62
Net appropriations for Canal maintenance and operation.....						111,040,331.38
Total miscellaneous receipts covered into U. S. Treasury.....						332,508,837.67
Net appropriations for Canal maintenance and operation.....						111,040,331.38
Net capital refundments from Canal operation.....						221,468,506.29

¹ Includes amortization, public works, Panama and Colon, bank interest, sale of Government property, etc., also Economy Act impoundings amounting to \$70,570.19.

² Miscellaneous appropriations for 1922, 1923, and 1924 were for increase of compensation; fiscal year 1934 covers National Recovery Act, \$1,000,000, and repatriation of unemployed aliens, \$150,000.

The balance in capital refundment account measures the difference between Canal revenues covered into the United States Treasury as miscellaneous receipts, United States revenues, from July 1, 1921, and the net amounts appropriated for maintenance and operation of the Canal. The appropriations for maintenance and operation include

provision for certain items of capital improvements, and in 1934 a separate appropriation for \$1,000,000 under the National Recovery Act also covers capital improvements. Actual cost of such improvements has been deducted from total appropriations and diverted to capital investment account (table no. 14).

Although the above table shows a net cash refundment of \$221,468,-506.29 such refundment is not deductible from capital investment, which is considered as measuring the value of the Panama Canal as an instrument of public utility upon which a perpetual interest return should be earned; furthermore, interest on the capital investment chargeable to operating account is not included in cash transactions with the United States Treasury. Capital interest at 3 percent from 1922 to 1933, chargeable to operating account, would have amounted to \$222,631,595.07, as set forth in table no. 21. Had the United States Treasury actually made this interest charge against the Canal the capital refundment balance indicated above would have been extinguished.

The decline in civil revenue in 1934 and 1935 is principally due to a change in law authorizing postal receipts to be repaid to Canal appropriations, instead of being covered into the Treasury as miscellaneous receipts. Postal receipts pertaining to the fiscal year 1935 have therefore been applied to reduce appropriation expenditures, and only the surplus of receipts over expenditure will hereafter be deposited to the credit of United States revenues.

Miscellaneous receipts deposited in the United States Treasury prior to 1922 have been applied to equalize appropriations for operation and working capital.

TABLE NO. 23.—*Balance of revenues and refundments*

DEBITS	
Revenue due U. S. Treasury (table no. 6).....	\$202,567.62
Appropriated cash in U. S. Treasury (table no. 9).....	6,277,162.17
Appropriated cash with fiscal officers (table no. 9).....	2,155,715.10
Accounts receivable (table no. 10).....	648,346.83
Stores (table no. 11).....	4,229,033.79
Work in progress (table no. 12).....	46,423.78
Deferred charges (table no. 13).....	132,619.69
Total debits.....	13,691,868.98
CREDITS	
Accounts payable (table no. 15).....	1,268,504.27
Reserve for replacements (table no. 16).....	1,917,316.65
Reserve for repairs (table no. 17).....	916,462.30
Reserve for vacation pay (table no. 18).....	465,967.00
Deferred credits (table no. 19).....	697,275.51
Total credits.....	5,265,525.73
Net current accounts.....	8,426,343.25
Less proportion under capital investment (table no. 14).....	4,120,000.00
Balance.....	4,306,343.25

A revolving fund now fixed at \$4,120,000 is set up in Canal accounting for working capital, and is credited to capital investment account in addition to funds used for construction and equipment, the total constituting the base for capital interest computations. Net working capital in excess of the revolving fund is considered as a temporary advance of Treasury funds, but is usually less than appropriated funds not withdrawn from the Treasury. Working capital investments are in constant process of accrual and liquidation for account of the United States Treasury.

TABLE No. 24.—*Canal revenues*

	Fiscal year 1934	Fiscal year 1935
Tolls.....	\$24, 065, 065. 16	\$23, 338, 977. 90
Postal surplus.....	25, 361. 53	7, 264. 32
Licenses, fees, fines, etc.....	70, 970. 20	72, 587. 40
Interest.....	5. 06	4. 49
Miscellaneous.....	329. 88	2, 101. 47
Total.....	24, 161, 731. 83	23, 420, 935. 58

Canal revenues shown above comprise earnings which by law must be covered into the United States Treasury as miscellaneous receipts, United States revenues, and relinquished from control of the Panama Canal, as distinguished from earnings repayable to Canal appropriations shown on tables 25 and 26.

Owing to a change in the law made effective at the beginning of the fiscal year 1934 the appropriation for postal expenses was discontinued, and postal receipts have been applied to defray such expenses, instead of being covered directly into the United States Treasury, as formerly, and only the surplus of postal receipts over postal expenses is for account of United States revenues.

TABLE No. 25.—*Canal earnings, expenses, and net revenues*

	Expenses	Earnings	Net expenses
Executive department:			
Executive offices.....	\$412, 477. 77	\$119, 537. 96	\$292, 939. 81
Clubs and playgrounds.....	108, 355. 00		108, 355. 00
Total.....	520, 832. 77	119, 537. 96	401, 294. 81
Accounting department:			
Accounting office.....	407, 724. 51	276, 844. 29	130, 880. 22
Paymaster's office.....	42, 459. 44	26, 839. 92	15, 619. 52
Collector's office.....	45, 934. 58	33, 246. 00	12, 688. 58
Total.....	496, 118. 53	336, 930. 21	159, 188. 32
Washington office.....	253, 100. 70	46, 924. 53	206, 176. 17
Civil government:			
Civil affairs.....	17, 843. 74		17, 843. 74
Customs.....	27, 794. 28	264. 50	27, 529. 78
Postal service.....	263, 820. 18	263, 820. 18	
Division of schools.....	424, 124. 70	36, 082. 53	388, 042. 17
Fire protection.....	122, 215. 16	622. 89	121, 592. 27

TABLE NO. 25.—*Canal earnings, expenses, and net revenues*—Continued

	Expenses	Earnings	Net expenses
Civil government—Continued.			
Police section.....	\$417,473.27	\$65,242.34	\$352,230.93
Magistrates' courts.....	17,794.16		17,794.16
District court.....	9,391.37		9,391.37
Total.....	1,300,456.86	366,032.44	934,424.42
Health department:			
Chief health office.....	31,365.86		31,365.86
Gorgas Hospital.....	656,194.76	305,483.57	350,711.19
Colon Hospital.....	145,972.47	76,243.15	69,729.32
Corozal Hospital.....	93,904.07	23,997.44	69,906.63
Palo Seco colony.....	43,118.15	25,432.50	17,685.66
Line dispensaries.....	85,826.08	28,646.64	57,179.44
Madden Dam dispensary.....	6,233.25	6,233.25	
Medical store.....	6,780.95		6,780.95
Quarantine service.....	68,408.93	20,566.12	47,842.81
Sanitation, Panama.....	33,707.80	7,806.20	25,901.60
Sanitation, Colon.....	20,565.88	2,728.08	17,837.80
Sanitation, Zone.....	154,835.41	54,297.68	100,537.73
Street cleaning and garbage collection, Panama.....	100,280.23	77,000.25	23,279.98
Street cleaning and garbage collection, Colon.....	48,679.06	37,718.07	10,960.99
Total.....	1,495,872.91	666,152.95	829,719.96
Technical divisions:			
Office engineer.....	113,495.96	85,481.19	28,014.77
Surveys.....	99,307.73	39,426.29	59,881.44
Total.....	212,803.69	124,907.48	87,896.21
Public buildings and grounds:			
Chief quartermaster's office.....	37,718.33	29,880.00	7,838.33
District quartermaster, Balboa.....	157,859.78	46,344.94	111,514.84
District quartermaster, Pedro Miguel.....	39,412.99	29,264.92	10,148.07
District quartermaster, Gatun.....	26,118.19	18,967.28	7,150.91
District quartermaster, Cristobal.....	72,480.80	25,585.05	46,895.75
Total.....	333,590.09	150,042.19	183,547.90
Marine division:			
Marine superintendent.....	18,799.68	1,447.30	17,352.38
Port captain, Balboa:			
General.....	118,040.24	4,883.45	113,156.79
Admeasurement of vessels.....	23,878.19	330.00	23,548.19
Pilotage.....	158,919.87	82,770.00	76,149.87
Handling lines.....	125,148.83	127,708.00	¹ 2,559.17
Tugs.....	96,269.92	68,353.90	27,916.02
Launches.....	83,199.46	75,337.50	7,861.96
Port captain, Cristobal:			
General.....	60,208.53	92.75	60,115.78
Admeasurement of vessels.....	25,187.33	880.00	24,307.33
Pilotage.....	181,607.84	202,820.00	¹ 21,212.16
Handling lines.....	119,608.97	129,276.00	¹ 9,667.03
Tugs.....	123,085.90	113,307.05	9,778.85
Launches.....	56,808.75	62,780.00	¹ 5,971.25
Aids to navigation.....	263,086.29	39,770.21	223,316.08
Total.....	1,453,849.80	909,756.16	544,093.64
Locks, operation and maintenance:			
Pacific locks:			
Miraflores Locks.....	475,333.50		475,333.50
Pedro Miguel Locks.....	342,830.33	60.00	342,770.33
Total Pacific locks.....	818,163.83	60.00	818,103.83
Atlantic locks:			
Gatun Locks.....	517,166.13		517,166.13
Gatun Locks, overhaul.....	537,755.26		537,755.26
Total Atlantic locks.....	1,054,921.39		1,054,921.39
Total.....	1,873,085.22	60.00	1,873,025.22
Gatun Dam and Spillway:			
Gatun Dam.....	38,960.95		38,960.95
Gatun Spillway.....	4,573.31		4,573.31
Total.....	43,534.26		43,534.26

¹ Denotes credit balance.

TABLE No. 25.—*Canal earnings, expenses, and net revenues*—Continued

	Expenses	Earnings	Net expenses
Dredging division:			
Atlantic entrance.....	\$159,674.88	-----	\$159,674.88
Gatun Lake.....	325,566.00	-----	325,566.00
Gaillard Cut.....	1,011,013.71	-----	1,011,013.71
Miraflores Lake.....	676.96	-----	676.96
Pacific entrance.....	19,324.77	-----	19,324.77
Cristobal Harbor.....	171,911.11	-----	171,911.11
Balboa Harbor.....	857.52	-----	857.52
Removal of floating obstructions.....	44,885.33	-----	44,885.33
Floating cranes, maintenance.....	38,935.66	-----	38,935.66
Dredging division work.....	303,740.60	\$296,412.35	7,328.25
Total.....	2,076,586.54	296,412.35	1,780,174.19
Municipal expenses:			
Street lighting.....	20,277.63	-----	20,277.63
Water for municipal purposes.....	23,400.00	-----	23,400.00
Roads, streets, and sidewalks.....	169,041.98	-----	169,041.98
Storm sewers.....	19,664.35	-----	19,664.35
Thatcher Ferry.....	75,406.10	-----	75,406.10
Total.....	307,790.06	-----	307,790.06
Miscellaneous general expenses:			
Proportion of general stores expenses.....	197,913.00	-----	197,913.00
Railroad tracks maintenance.....	20,131.75	-----	20,131.75
Recruiting and repatriating employees.....	20,234.67	-----	20,234.67
Repatriating alien ex-employees.....	27,725.66	-----	27,725.66
Transportation on the Isthmus.....	120,000.00	-----	120,000.00
Damage to vessels.....	1,210.56	-----	1,210.56
Canal Zone experimental gardens.....	5,000.00	-----	5,000.00
Miscellaneous.....	1,723.49	-----	1,723.49
Depreciation on fixed property.....	1,006,625.28	-----	1,006,625.28
Annual payment to the Republic of Panama.....	250,000.00	-----	250,000.00
Sale of the collier <i>Achilles</i>		100,000.00	¹ 100,000.00
Net Canal expenses.....	12,018,185.84	3,116,756.27	8,901,429.57

¹ Denotes credit balance.

SUMMARY

Canal revenues (table no. 24).....	\$23,420,935.58
Net Canal expenses.....	8,901,429.57
Net Canal revenues.....	14,519,506.01

The earnings of the divisions engaged in the transiting of vessels through the Canal, as well as earnings of sanitation and civil government divisions, are deducted from gross expenses to arrive at the net expenditure from Canal appropriations, which in turn is deducted from Canal revenues to arrive at net Canal revenues, exclusive of business division profits.

Earnings of the executive offices and accounting department represent principally a proportional charge against business divisions of the Panama Canal and the Panama Railroad Co. Business divisions are reimbursed for this proportional expense by adding a surcharge to the direct cost on all work performed. The Panama Railroad's proportion is distributed to the various units of that organization.

The government's contribution to the operation and maintenance of clubs and playgrounds was \$108,355 in 1935. All expense in excess of this amount is paid from receipts and profits from the operation of the clubhouses.

The earnings of the Washington office include \$46,600 charged against business storehouse operations to cover a proportional part

of the cost of purchasing, inspection, and handling of material used by business divisions or sold to outside interests, which expense is covered through surcharges added to the price of material.

TABLE NO. 26.—*Business expenses, revenues, and profit and loss*

Division	Expenses	Revenues	Profit or loss
Electric light and power system.....	\$192, 159. 73	\$783, 284. 02	\$291, 124. 29
Electric work.....	573, 642. 59	604, 443. 69	30, 801. 10
Telephone, telegraph, and signal work.....	151, 910. 43	156, 465. 14	4, 554. 71
Water system.....	447, 809. 90	506, 209. 08	58, 399. 18
Municipal work.....	1, 018, 746. 00	1, 065, 785. 93	47, 039. 93
Shops and drydocks.....	2, 680, 817. 16	2, 791, 840. 10	114, 022. 94
Wharves and piers.....	78, 140. 96	78, 246. 91	105. 95
Fuel-oil plants.....	634, 630. 97	802, 146. 20	167, 515. 23
General storehouses.....	4, 390, 438. 99	4, 502, 291. 06	111, 852. 07
Motor transportation.....	403, 397. 25	450, 103. 09	46, 705. 84
Motor-car repair shops.....	171, 583. 87	170, 789. 91	1 793. 96
Building repairs and construction.....	1, 310, 503. 34	1, 351, 181. 48	40, 678. 14
Panama Canal press.....	182, 607. 30	198, 272. 64	15, 665. 34
Gold quarters.....	508, 595. 82	517, 389. 73	8, 793. 91
Silver quarters.....	262, 790. 97	262, 911. 72	120. 75
Rented buildings.....	43, 074. 17	72, 842. 23	29, 768. 06
District quartermasters' supplies.....	243, 317. 26	245, 667. 71	2, 350. 45
Farm Bureau.....	22, 394. 93	23, 574. 49	1, 179. 56
Nautical charts and publications.....	1, 388. 82	2, 387. 35	998. 53
Sand and gravel.....	65, 466. 38	68, 939. 70	3, 473. 32
Madden Dam division.....	812, 959. 14	812, 959. 14	-----
Fortifications division.....	27, 709. 07	27, 709. 07	-----
Public works:			
Panama.....	286, 032. 23	313, 699. 20	27, 666. 97
Colon.....	157, 598. 45	170, 792. 75	19, 194. 30
Total.....	14, 967, 715. 73	15, 988, 932. 34	1, 021, 216. 61

1 Denotes loss.

The profit on business operations as above, amounting to \$1,-021,216.61, compares with profits in 1934 of \$1,366,755.12. However, salary reductions due to economy acts amounted to only \$144,851.74 in 1935, compared with \$596,554.74 in 1934. Eliminating the economy act savings in both years would show normal profits of \$876,364.87 in 1935, compared with \$770,200.38 in 1934.

Profits on public works, Panama and Colon, amounting to \$46,861.27 have been currently reported for coverage into general funds of the United States Treasury. The balance of the total profits, amounting to \$974,355.34, will be immediately covered into the Treasury as miscellaneous receipts, United States revenues, in accordance with regulations.

Business operations of the Panama Canal are conducted separately from operating activities pertaining directly to the transiting of vessels and government of the Canal Zone. The annual appropriation acts for the Panama Canal authorize the use of appropriated funds for the conduct of auxiliary business activities, provided that funds so advanced are recovered through earnings, and with further proviso that any net profit derived from such business activities be covered annually into the United States Treasury.

TABLE No. 27.—Balances in appropriation and fund accounting ledger, June 30, 1935

Assets		U. S. Treasury appropriations	Cash on hand	Accounts receivable	Transfers available	Storehouse stock	Total
Maintenance and operation, Panama Canal		\$6,051,548.00	\$1,845,599.17	\$550,164.93	\$69,933.71	\$4,161,308.49	\$12,679,554.30
Sanitation, Canal Zone, Panama Canal		2,207.28	134,275.47	83,202.22	---	65,917.15	285,602.12
Civil government, Panama Canal and Canal Zone		44,626.74	75,357.31	7,379.68	---	1,808.15	129,171.88
National Industrial Recovery, Panama Canal, 1933-35		121.27	75,967.91	---	---	---	1,089.18
Postal funds, Canal Zone (special fund)		78,638.88	75,374.39	7,600.00	---	---	161,833.27
Repatriation of unemployed aliens, Panama Canal		100,000.00	22,940.85	100.00	---	---	122,940.85
Miscellaneous receipts, United States revenues		---	202,467.62	---	974,355.31	---	1,176,922.96
Total		6,277,162.17	2,358,182.72	643,446.83	1,044,289.05	4,229,033.79	14,557,114.56

Liabilities		Working capital allotment	Reserve for impounded balances	Accounts payable	Transfers payable	Contingent liabilities	General ledger reserves	Balance	Total
Maintenance and operation, Panama Canal		\$4,010,000	\$24,841.23	\$1,065,254.54	\$974,355.34	\$348,379.24	\$3,299,745.95	\$2,956,978.00	\$12,679,554.30
Sanitation, Canal Zone, Panama Canal		100,000	11,760.43	111,462.68	41,987.41	27,689.73	---	6,222.73	285,602.12
Civil government, Panama Canal and Canal Zone		10,000	14,143.95	75,959.74	23,849.04	10,068.37	---	13,438.68	129,171.88
National Industrial Recovery, Panama Canal, 1933-35		---	---	---	---	---	---	1,089.18	1,089.18
Postal funds, Canal Zone (special fund)		---	2,524.67	15,423.81	3,834.25	132,094.70	---	7,955.84	161,833.27
Repatriation of unemployed aliens, Panama Canal		---	---	403.50	263.01	---	---	122,274.34	122,940.85
Miscellaneous receipts, United States revenues		---	---	1,176,922.96	---	---	---	---	1,176,922.96
Total		4,120,000	21,461.52	2,445,427.23	1,044,289.05	518,232.04	3,299,745.95	3,107,958.77	14,557,114.56

t Denotes debit.

This table shows the status of Panama Canal working capital by the various appropriations and funds by which it is separately accountable under existing laws and Treasury regulations.

A revolving fund of \$4,120,000 is set aside in Canal accounting to cover the net investment in current accounts, which sum is included in the capital investment account (table no. 14).

Of the \$3,107,958.77 shown as available in the balance column, \$583,670 will be used to reduce appropriation requirements in 1937; \$950 of the balance of \$1,089.18 remaining in the national industrial recovery fund has been allotted for expenditure in 1936; the \$7,955.84 representing postal surplus is for account of United States revenues; and of the balance of \$122,274.34 in the fund for repatriation of unemployed aliens, \$36,000 has been allotted for expenditure in 1936, and the remaining \$86,274.34 will be allotted subsequently; the remainder, amounting to \$2,429,920, has been allotted in the fiscal year 1936 to supplement Canal appropriations as follows:

	Balance, 1935	Appropriation, 1936	Allotment, 1936
Maintenance and operation, Panama Canal.....	\$2,389,230	\$6,900,000	\$9,289,230
Sanitation, Canal Zone, Panama Canal.....	1,198	874,616	875,814
Civil government, Panama Canal and Canal Zone.....	2,542	1,022,981	1,025,523
National industrial recovery, Panama Canal.....	950	-----	950
Repatriation of unemployed aliens, Panama Canal.....	36,000	-----	36,000
Total.....	2,429,920	8,797,597	11,227,517



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